JUNE 1955

# AMERICAN ARTISAN

## WARM AIR HEATING
## RESIDENTIAL AIR CONDITIONING
## SHEET METAL CONTRACTING

JUN 16 1955

KEY TO DESIGN air conditioning distribution systems . . . . 60

NCHA AIRS management and merchandising techniques . . 69

APPLICATIONS FOR sheet metal are on the increase . . . . . 126

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# What's new in modern home heating?

## JACKSON & CHURCH'S NEW COPPERTONE SERIES

## FOR ALL RESIDENTIAL NEEDS!

**Now . . . more than ever before . . . Jackson & Church offers the truly complete . . . competitive line of warm air heating equipment.**

**The addition of the new Coppertone Series featuring the new four-pass heater with the easy clean-out meets the needs of all small residential building and development housing, with dependable, high quality equipment, competitively priced.**

**Coppertone Series is new and smart looking but best of all it has engineering features that have made the Jackson & Church name famous in residential, commercial and industrial heating.**

**Note the types available—note the range of sizes—then contact your J-C representative or dealer for the competitive prices!**

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GAS HIGHBOY
*INPUTS 85,000, 113,800, 141,250*

OIL HIGHBOY
*OUTPUTS 75,000, 100,000, 125,000*

GAS LOWBOY
*INPUTS 85,000, 113,800, 141,250*

OIL LOWBOY
*OUTPUTS 75,000, 100,000, 125,000*

GAS COUNTERFLOW
*INPUTS 85,000, 113,800, 141,250*

OIL COUNTERFLOW
*OUTPUTS 75,000, 100,000, 125,000*

GAS SUSPENDED LOWBOY
*INPUTS 85,000, 113,800, 141,250*

*America's largest and most complete warm air heating line... the line that has everything!*

J-C **JACKSON & CHURCH** FURNACE DIVISION

SAGINAW, MICHIGAN

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# IS THE

# PLACE

*Illustrated above:* **Just three of the 25 efficient Chase warehouses dotting the nation.**

# FOR STAINLESS STEEL!

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**BRASS & COPPER CO.**

**WATERBURY 20, CONNECTICUT • SUBSIDIARY OF KENNECOTT COPPER CORPORATION**

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*The Nation's Headquarters for Brass & Copper*

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# AMERICAN ARTISAN

## JUNE 1955

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*Founded 1864*

*Volume 92 No. 6*

**WARM AIR HEATING**

**RESIDENTIAL AIR CONDITIONING**

**SHEET METAL CONTRACTING**

Merged with American Artisan are "Warm Air Heating" and "Furnaces and Sheet Metals"



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Published monthly by Keeney Publishing Company, 6 N. Michigan Ave., Chicago 2, Ill., U.S.A.


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**Member of Audit Bureau of Circulations, Magazine Publishers Association, Inc., and Associated Business Publications**

Yearly Subscription Price—U.S. and possessions, $3.00; Canada, Cuba, Mexico, South America, Central America, $4.00; Others $6.00. Single copies, U.S. and possessions, 35c. Back numbers, 60c. January, 1955, Directory Issue, $1.50 per copy. *Change in Address*: Report new and old address to publisher and local post office; deadline date 18th of preceding month. Entered as second-class matter, July 29, 1932, at the post office at Chicago, Illinois, under the Act of March 3, 1879. Additional entry at Mendota, Ill.

# *New* Mueller Climatrol

## TYPE 119-219 WINTER AIR CONDITIONERS

Let you include Mueller Climatrol quality without extra cost!

### *New* — Flexible, low-cost cooling takes no floor space —Type 912 Coil Unit

This new Type 912 coil unit is available in 2- and 3-ton sizes for installation horizontally in the plenum of any highboy or lowboy unit having sufficient fan capacity. It is used with Mueller Climatrol Types 902 water-cooled or 908 air-cooled remote condensing units. Available less coils — gives you low cost provision for adding cooling later. Write for detailed specifications and data.

D-185

### Additions to Mueller Climatrol's *Suburbanaire Line*

Here are two more *salesmakers* in the new Mueller Climatrol Suburbanaire line. They're priced to let you meet competition on project homes, yet they maintain Mueller Climatrol quality throughout—in appearance and construction. Just check these features:

★ **Compact, attractive** — only 45¾" high; 45¾" wide; 26¼" deep plus rear diverter and gas or oil burner vestibule.

★ **Sized right** — 100,000 Btu input on gas; 110,000 Btu on oil. Has large blower to insure required capacity with slower, quieter blower operation.

★ **Easily installed**—shipped in two easy-to-handle sections for quick assembly on the job.

★ **Adaptable for Cooling** — at low cost. See the new Type 912 coil unit (at left) which makes it simple to include cooling without extra floor space.

It will pay you to get the complete specs on these new Suburbanaire lowboys. Check them out, feature by feature — including price. They can't be matched. Write for complete information — today.

**Mueller Climatrol**

98th Anniversary

Dept. 165, 2030 W. Oklahoma Ave., Milwaukee, Wis.

## the editor's notebook

### *Thumbing Through This Month's Artisan*

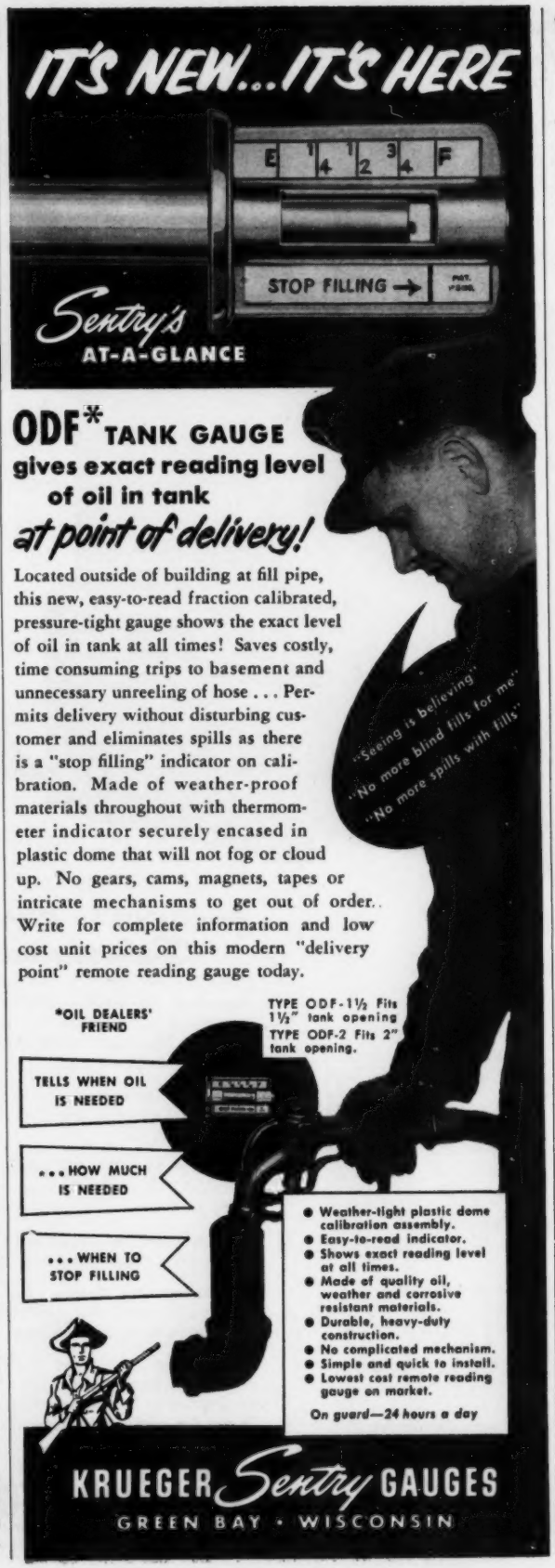
. . . we learn *How to Design Year 'Round Air Conditioning Distribution Systems* in an article by Clarence L. Grandstaff, who describes the method now used by his company and being considered for recommendation by NWAHACA, which should produce a well balanced distribution system for heating as well as cooling.

### Controls . . .

AND WE see how the *Magic of Electronics Sells Control Circuits* to modern Americans who are not only intrigued by the term "electronics" but also are enthusiastic at the prospect of temperature control based on outdoor conditions and capable of anticipating and compensating for any temperature changes before they actually occur within the living area. Author W. L. Wilson describes how one warm air heating dealer capitalizes on these characteristics to build a profitable control business.

### Mortgage . . .

AND WE are introduced to a comparatively new selling tool for warm air heating dealers in William Hurd Hillyer's article, *Wrap Up Air Conditioning Sales With Package Mortgage Contract.* This popular plan allows a home buyer to purchase additional equipment along with his home mortgage and extend his payments through the entire mortgage period — a ripe field for dealers who sell builders on the attractiveness of being able to offer year



IT'S NEW...IT'S HERE
E 1/4 1/2 3/4 F
STOP FILLING
Sentry's
AT-A-GLANCE
ODF* TANK GAUGE
gives exact reading level of oil in tank
at point of delivery!
Located outside of building at fill pipe, this new, easy-to-read fraction calibrated, pressure-tight gauge shows the exact level of oil in tank at all times! Saves costly, time consuming trips to basement and unnecessary unreeling of hose . . . Permits delivery without disturbing customer and eliminates spills as there is a "stop filling" indicator on calibration. Made of weather-proof materials throughout with thermometer indicator securely encased in plastic dome that will not fog or cloud up. No gears, cams, magnets, tapes or intricate mechanisms to get out of order. Write for complete information and low cost unit prices on this modern "delivery point" remote reading gauge today.
"Seeing is believing"
"No more blind fills for me"
"No more spills with fills"
*OIL DEALERS' FRIEND
TYPE ODF-1½ Fits 1½" tank opening
TYPE ODF-2 Fits 2" tank opening.
TELLS WHEN OIL IS NEEDED
. . . HOW MUCH IS NEEDED
. . . WHEN TO STOP FILLING
Weather-tight plastic dome calibration assembly.
Easy-to-read indicator.
Shows exact reading level at all times.
Made of quality oil, weather and corrosive resistant materials.
Durable, heavy-duty construction.
No complicated mechanism.
Simple and quick to install.
Lowest cost remote reading gauge on market.
On guard—24 hours a day
KRUEGER Sentry GAUGES
GREEN BAY • WISCONSIN


## the editor's notebook

*(continued)*

'round conditioning at only a few cents a month extra.

### Aluminum . . .

AND WE inspect the characteristics and trace the development of sheet aluminum in shop work, in G. W. Birdsall's article, *Versatility Sponsors Growth of Sheet Aluminum.* Mr. Birdsall points out the advantages of the popular metal in fabrication, appearance and decreased tool wear in his attempt to help sheet metal contractors gain a better understanding of the properties of this increasingly important factor in the profit picture.

### *Urges SM Workers To Protect Jurisdiction*

IT IS GOOD to hear Edward F. Carlough, general secretary-treasurer of the Sheet Metal Workers' International Association, express his views on cooling and the role of the sheet metal worker in the coming boom. Mr. Carlough sees "tremendous potentialities" for the sheet metal worker in the rising volume of air conditioning work, but notes that jurisdictional problems are likely to arise as the demand for air conditioning increases. He urges sheet metal workers to know their jurisdiction and to protect it, "to fight for what we have gained and see that we do not tolerate any trespass against our rightful jurisdictional areas."

### *Sees Continued Growth Of New House Market*

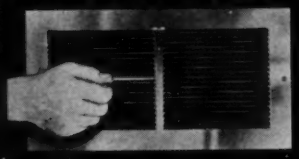
I WAS interested in the remarks made recently by L. M. Cassidy in answer to claims that the country is "overbuilding." Mr. Cassidy,

# H&C The ALL★STAR Line

OUR BEST BET FOR EACH AND EVERY INSTALLATION

## CONVENTIONAL A.C. SYSTEMS

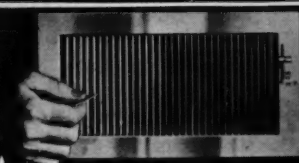
SIDEWALL AND BASEBOARD



**No. 74 DESIGN**
Low-Cost QUALITY registers.

**No. 75 DESIGN**
The only registers with the TURNING BLADE VALVE.

**No. 76 DESIGN**
Fin type face with multi-shutter valve. Very popular.



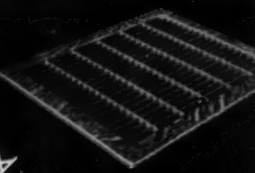
**No. 88 DESIGN**
Adjustable Bar Type. Multi-shutter valve. Sizes up to 20" x 30".

**CEILING DIFFUSER**
Sizes 6, 8, 10, 12, 14. No. 12 Dual Control Damper available.

## GRAVITY SYSTEMS

**No. 130 SERIES**
Baseboard Register, adjustable fin type.

**No. 330 SERIES**
Sidewall Register, companion to No. 130.

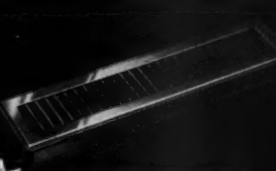


**No. 210 NO-FLEX™**
Floor Register. Sturdy and rigid.

**No. 265 "NO-FLEX"**
RETURN AIR FACE. Large free area.

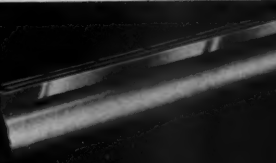
## PERIMETER SYSTEMS

**No. 401 SIDEWALL DIFFUSER**
With Volume Control Valve. Blankets wall of average room.

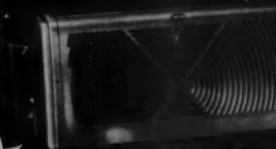


**No. 411 FLOOR DIFFUSER**
With opposed louvers for perfect air pattern.

**No. 44 SERIES CONTINUOUS**
BASEBOARD — Requires no tools to assemble or disassemble. For installation in multiples of 2" and 4".



**No. 452 HIGH CAPACITY**
BASEBOARD UNIT (2 ft.)



**No. 405 BASEBOARD DIFFUSER**
No stackhead required. Projection 2⅞"

# HART & COOLEY MANUFACTURING CO.

**PRODUCT OF THE WORLD'S LARGEST and MOST PROGRESSIVE PRODUCERS OF REGISTERS and GRILLES**

## the editor's notebook

*(continued)*

chairman of the board of Johns-Manville Corp., said he believes the present pace of new home construction is actually the result of "a revolution in income, a revolution in where people want to live" plus convenient credit terms. He pointed out that we will have about 1,600,000 new marriages this year, and that "these young married couples do not want to move into old vacated homes which are mostly obsolete in design and equipment and are generally in the older sections of cities. What is more, they can afford to move into new homes. Today nearly three-quarters of our 37 million non-farm families are getting over $4000 a year and therefore can afford — according to the standard bankers' rule-of-thumb — a $10,000 house, which today is a reasonably satisfactory one."

### *Firm Supplies Metal Business Cards*

FREQUENTLY we have received letters from American Artisan readers asking where they can obtain metal business cards suitable for use by sheet metal contractors. We recently saw such a card, made of aluminum foil plate, which may be purchased from C & H Supply Co., 415 E. Beach Ave., Inglewood 3, Calif. The cards are available in a wide range of colors and are designed to resist peeling, chipping and cracking.

### *Engineers Discuss Clearer Specifications*

RECENTLY we received from Hugh B. Reid, author of the Artisan's monthly pattern problem, a report on the 25th annual meeting of the Michigan Engineering Society held at Bloomfield Hills, Mich. Mr. Reid, a member of this group, pointed out in his report to us that one of the objectives of the Michigan society is to have written specifications prepared more effectively. The society is endeavoring to have consulting engineers write specifications that will direct work to be done on a construction project to the contractor skilled in the particular trade most suited to handle the installation. It is our opinion that the increased interest on the part of consulting engineers in more effective written specifications can be credited to the continuous efforts on the part of individual sheet metal contractors and their local and national associations to educate the engineer in knowing what type of work can best be installed by the sheet metal trade.

Such integral values as design, construction and performance give the Sundstrand line selling power backed by consumer acceptance.

The public hears about Sundstrand. They see Sundstrand. They buy Sundstrand.

***Because:*** **Ultimate heating satisfaction means having an oil burner with**

★ *DURABILITY*
★ *DEPENDABILITY*
★ *COMPACT DESIGN*
★ *OVERALL ECONOMY*
★ *QUIET OPERATION*

**These salient features result from 32 years of engineering and development by Sundstrand. Available is a complete line of oil burners for new installations or conversion. To increase *your* sales with Sundstrand,**

***write to —***

**SUNDSTRAND ENGINEERING CO.**
**ROCKFORD, ILLINOIS**


## the editor's notebook

*(continued)*

### *1168 Miles of Pipeline To Be Retired*

WE READ with some interest a report from the Federal Power Commission stating that a decision has been filed by an FPC presiding examiner authorizing Texas Eastern Transmission Corp., Shreveport, to retire part of its "Little Inch" pipeline system from natural gas service and to construct new facilities to enable it to continue to provide service as is presently being rendered.

Texas Eastern plans to retire that segment of the original Little Inch system between Baytown, Tex. and Moundsville, W. Va., consisting of a total of about 1168 miles of pipeline and five compressor stations. The company also plans to retire part

# *Take a look at this* SNAP LOCK MACHINE

*. . . that's made and guaranteed by Lockformer*

*. . . priced for the sheet metal shop!*

## LOOK...

**Fabricates both the receiver lock and the offset lock for both round or square duct.**

**Snap Lock is made flat—no restrictions on diameter of pipe or size of duct.**

**Work is easily nested and stored for assembly on the job.**

**Fabricates 24 to 30 gauge, requires only standard 110 or 220 volts.**

**As easy to operate, and as foolproof as your Lockformer.**

Announced early this year, the Lockformer Snap Lock Machine has already received its "Final OK" from the dozens of Sheet Metal Contractors now using them. A number of machines, we know, have already paid for themselves out of savings effected. Write us for complete information and prices.

*Send for your free copy of the new Lockformer Catalog*

**THE LOCKFORMER CO.**

4615 WEST ROOSEVELT ROAD CHICAGO 50, ILLINOIS

## the editor's notebook

*(continued)*

of the installed compressor horsepower at 16 other stations. It would then convert the Little Inch line to the transportation of petroleum products.

The natural gas now being moved through the Little Inch system would be transported by means of new facilities, authorized by the presiding examiner's decision, together with other existing facilities. The new facilities include a total of about 481.5 miles of pipeline, 86,900 hp in new compressor stations, and 36,020 additional hp in existing stations.

### *House "Trade-Ins" Provide Heating Work*

WARM AIR HEATING dealers and sheet metal contractors are finding that houses taken "in trade" by builders are providing an excellent market for modernization work. Leads for obtaining such business may be found in the building permits issued to builders for remodeling of trade-in property.

### *Servicemen Study Customer Relations*

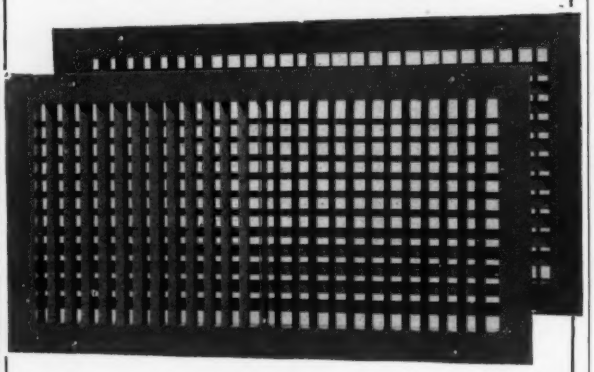
L. K. BAXTER of the Westinghouse Electric Corp. writes me that the firm has started an intensive training program designed to teach servicemen the elements of customer relations. "Early in our service experience," he says, "we recognized the fact that a good serviceman must be more than a good mechanic. He must also be a diplomat — courteous, attentive and sympathetic to the customer's problem. Since many people are not born with these qualities, we developed customer relations training so the serviceman may improve himself and his employer in the eyes of the customer."

The new program is now being presented by Westinghouse regional and district service managers in all parts of the country. It is expected to reach over 10,000 dealer and distributor service men.


**New Heating and Air Conditioning**

# GRILLE

***With Detachable Volume Control***



- **Increased Directional Control**
- **Eliminates Possibility of Tampering or Accidental Changes**
- **Meters Air-flow Accurately**

New features never before available . . . increased directional control, tamper-proof regulating, unmatched beauty, rugged strength and extreme ease of installation.

Extruded aluminum vanes are individually adjustable. Their unique shape provides greater directional control, and reduces air resistance to a minimum. This means more accurate balancing.

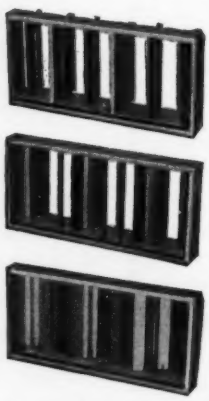
Each vane individually controlled. Operates under spring-loaded tension, eliminating any possibility of deflection pattern being altered by accident or tampering.

Fully-enclosed, wrap-around frame makes grille sturdier, assures easier, safer installation. Entire mechanism is concealed eliminating possibility of "air leaks".

Series "400" A-J Grilles (with — or without volume control) available in any size. Choice of vertical or horizontal louvers only — or combination of both, with either louver in front. Both sets of louvers adjustable without removing grille. Available in prime coat, hammered bronze or metallic gray or any standard finish.

***MATCHING RETURN AIR GRILLES AVAILABLE***

**NEW Detachable Volume Control**



Easy to operate. Accurately meters air-flow from a "Whisper" to a "Full Blast"! A volume control you can depend on! Meters the flow accurately at every stage — from fully closed to fully open. No "dead spots". Louvers move simultaneously in opposing directions. Gear-driven action. System may be balanced without removing outer grille. Available with grille, or can be quickly installed later.

*For More Information — Call or Write*

**A-J MANUFACTURING CO.**

2119 Washington St. Dept. A-6 Kansas City 8, Mo.


## the editor's notebook

*(continued)*

### *New Reader Likes Cooling Articles*

A NEW subscriber in Palermo, Calif. — E. J. Sweem — writes: "Magazine seems the very one I've been looking for. Am starting in business with the accent on air conditioning, so appreciate articles of the type you feature."

### *Editor Gets Souvenir Of New AFL Building*

WE RECENTLY became the proud owner of a new copper ash tray — not just an ordinary ash tray, but one made of the same copper sheet that was used in fabricating the metal box that will go into the cornerstone of the new AFL building in Washington, D. C. We like to think that this small piece of metal symbolizes the many advances made by sheet metal workers and the sheet metal industry in general during the course of the past several years. We appreciate the thoughtfulness of Paul Stromberg, who presented the gift, and in whose shop the cornerstone box was fabricated by Charles Heinz, a member of I. U. 102.

### *Dealer Uses Service As Sales Builder*

LAST MONTH we published an article about the operation of the Bower-Kramer Sheet Metal Shop. This small dealer

HOW

# ®Janitrol

HELPS YOU

## SELL QUALITY... INSTEAD OF PRICE

Now you can stop selling on just price alone! The Janitrol "Crusade For Better Heating" makes it A-B-C easy for you to sell quality . . . offer the type of service you're proud of. Here's how the Janitrol Crusade works for you:

"Imagine me
...telling my husband about heating!"
I learned you don't have to be an expert to measure heating quality. And one big measure is longer furnace life.
I learned that now you can have a furnace that can outlast the mortgage! The secret is in a new design . . . Dura-tube
Dura-tube is the heating heart of the Janitrol Deluxe furnace. Now you can forget about burn outs, cracks and rusting. Dura-tube is even better than the steel or cast iron used in other furnaces. That's why these Janitrol Dura-tube models are practically indestructible ...why Janitrol costs you less in the long run.
She was right!

**A** Consistent, year 'round advertising . . . like this in all leading home owner magazines alerts the public to the measurable value of Janitrol quality heating . . . obtains thousands of inquiries.

**B** This outstanding brochure . . . is sent to all who inquire. Dramatically illustrated in full color, it tells the public *how heating quality can be measured* . . . tells a powerful sales story that pre-sells Janitrol for you.

**C** For your personal presentation this full-color Trans-Vision manual lets you x-ray the interior features of the Janitrol furnace. In just minutes, it makes quality heating easy to understand . . . Janitrol easier to sell . . . makes profit practicable!

FREE SAMPLES — SEE FOR YOURSELF!

JOIN Janitrol's CRUSADE FOR BETTER HEATING

®Janitrol
HEATING AND AIR-CONDITIONING DIVISION
Surface Combustion Corp., Columbus 16, Ohio

Please let me see more on your complete Crusade Program.

Name_____

Address_____

City_____ State_____

## the editor's notebook

*(continued)*

(seven employees) does a large volume of housing project installations, and Vic Kramer attributes much of his success in securing this type of business to the firm's reputation for service, both to the home owner and to the builder. We were pleased to note, in a recent bulletin of the National Warm Air Heating and Air Conditioning Association, that Bower-Kramer's policy of close cooperation with the builder and its ability to meet heavy production schedules are receiving favorable comment from other quarters. NWAHACA, too, commenting on the volume of housing project work done by the company, notes that "it's service that sells the builder."

### *Sees Rising Sales, Stiffer Competition*

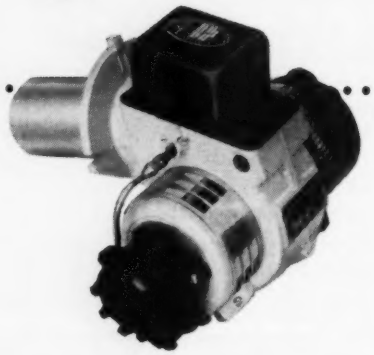
GWILYM A. PRICE, president, Westinghouse Electric Corp., predicts a year of continuing high sales and rising new orders, accompanied by greatly intensified competition. Mr. Price pointed out that increasing competition has resulted in a "strong downward pull on prices."

"This is true in the consumer products field," he said, "where a great many manufacturers are competing for a larger share of a vast market. But it is no less true, in varying degrees, for products manufactured for industrial, utility, and other uses."

Along with this pressure for lower prices, he said, the basic costs of doing business continue to show an upward trend. The result, he said, is greatly increased pressures on profit margins.

Several of the dealers we've talked to lately have


7 *new models*



1 Over 20 different firing combinations . . . with the new "Spitfire" made especially for furnace and boiler manufacturers. That's Model F-285, Nu-Way's newest. Firing range: .65 to 2.85 gallons per hour.

*fit any job . . .*

| | | MODEL |
|---|---|---|
| 2 | .65 to 1.75 gal. per hr. | IXL-175 |
| 3 | 1.75 to 3.0 gal. per hr. | IXL-300 |
| 4 | 2 to 5 gal. per hr. | XLO-500 |
| 5 | 3 to 8 gal. per hr. | CO-800 |
| 6 | 8 to 15 gal. per hr. | XL-1500 |
| 7 | 15 to 20 gal. per hr. | XL-2000 |

There's a Nu-Way Oil Burner to fit almost any job — large or small, residential or commercial. Every model is engineered with features like 0.0015 inch motor pump alignment . . . sand-cast aluminum alloy housing . . . dependable transformers, manufactured extra-heavy by Nu-Way . . . easy servicing . . . in-operation nozzle adjustment . . . adjustable floor, flange or mounting. No wonder Nu-Way burners are standard equipment on boilers and furnaces made by so many leading manufacturers! Write today for Bulletin N1132 on new oil burners.

THE *Nu-Way* CORPORATION
ROCK ISLAND, ILLINOIS

Nu-Way OIL HEATING EQUIPMENT

*Nu-Way is a member of O.H.I. and I.B.R.*
*"Automatic Oil Heat Exclusively Since 1921"*


## the editor's notebook

*(continued)*

shown considerable interest in advertising and publicity. Evidently they agree with Mr. Price that stiffer competition is to be expected, and believe that one way to meet it is by developing and improving their public relations programs.

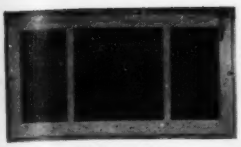
### *Urges Dealers To Stress "Quality"*

LOUIS DEMMLER, Pittsburgh distributor, recently told me about a conversation he'd had with a home builder. The builder said, in effect, that the only reason he was using warm air heating in his homes was that it cost him less. ("Incidentally," Mr. Demmler says, "he really was getting a cheap job — not only cheap in price but in quality too. And he knew nothing of the advantages of air circulation, humidification, filtration, even heat distribution, fast thermostat response, operating economy and the many other benefits which a *good* warm air installation could provide for his home buyers.")

Mr. Demmler concluded — and we agree with him — that the warm air heating dealer has to get out and sell — sell quality — to architects, builders, prospective home owners and everyone else with whom he comes in contact. Only by constantly telling the public about warm air heating, he feels, can the dealer impress on prospective buyers, whether they are builders or homeowners, the many advantages offered by a first-class warm air heating installation.

*Clyde M. Barnes*

EDITOR

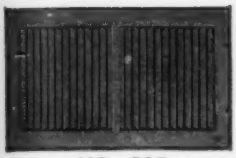


**NO. 80**

Aspirating perimeter sidewall diffuser.

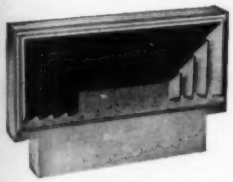
**NO. 512**

Perimeter floor register.



**NO. 305**

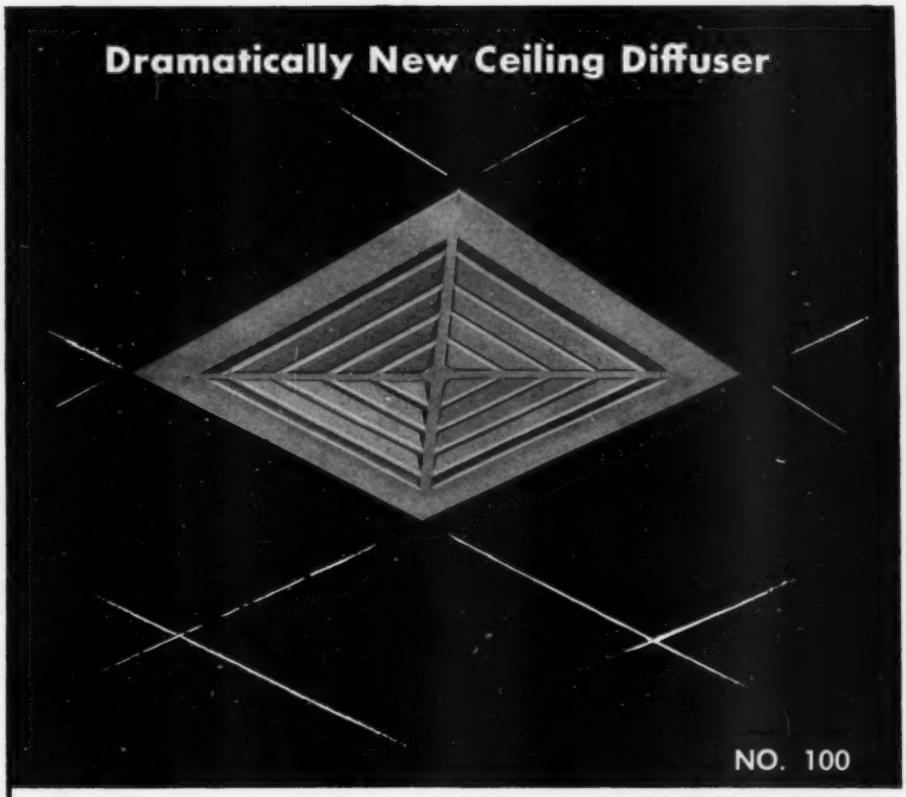
½" vertical fin sidewall multiple louver register for commercial air conditioning.



**NO. 99**

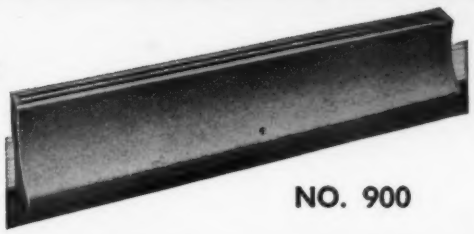
Out-of-wall or in-the-wall aspirating perimeter register.

## Dramatically New Ceiling Diffuser



**NO. 100**

**MIDCO'S BALANCED FLOW BASEBOARD PERIMETER DIFFUSER #900**



**NO. 900**

A COMPLETE LINE OF REGISTERS GRILLES FLOOR FACES

## YES! Beauty and Performance unmatched... with a more profitable turnover for you!

**It's the Midco jobber's success story all over again! This time with two diffusers boasting of an ultra-modern design—amazing effectiveness —and conveniently adjustable, no draft blades.**

**Midco's ceiling diffuser No. 100 is available in 6" - 8" - 10" - 12" and 14" sizes. Midco's baseboard diffuser No. 900 comes in 17" - 24" - 30" and 36" sizes.**

**Yes—Midco's Diffusers combine an engineer's dream of design with a jobber's idea of price . . . creating more profits for you!**

***Why not invest the next few seconds in a postcard to Midco. Ask why Midco jobbers and installers make consistently better livings!***

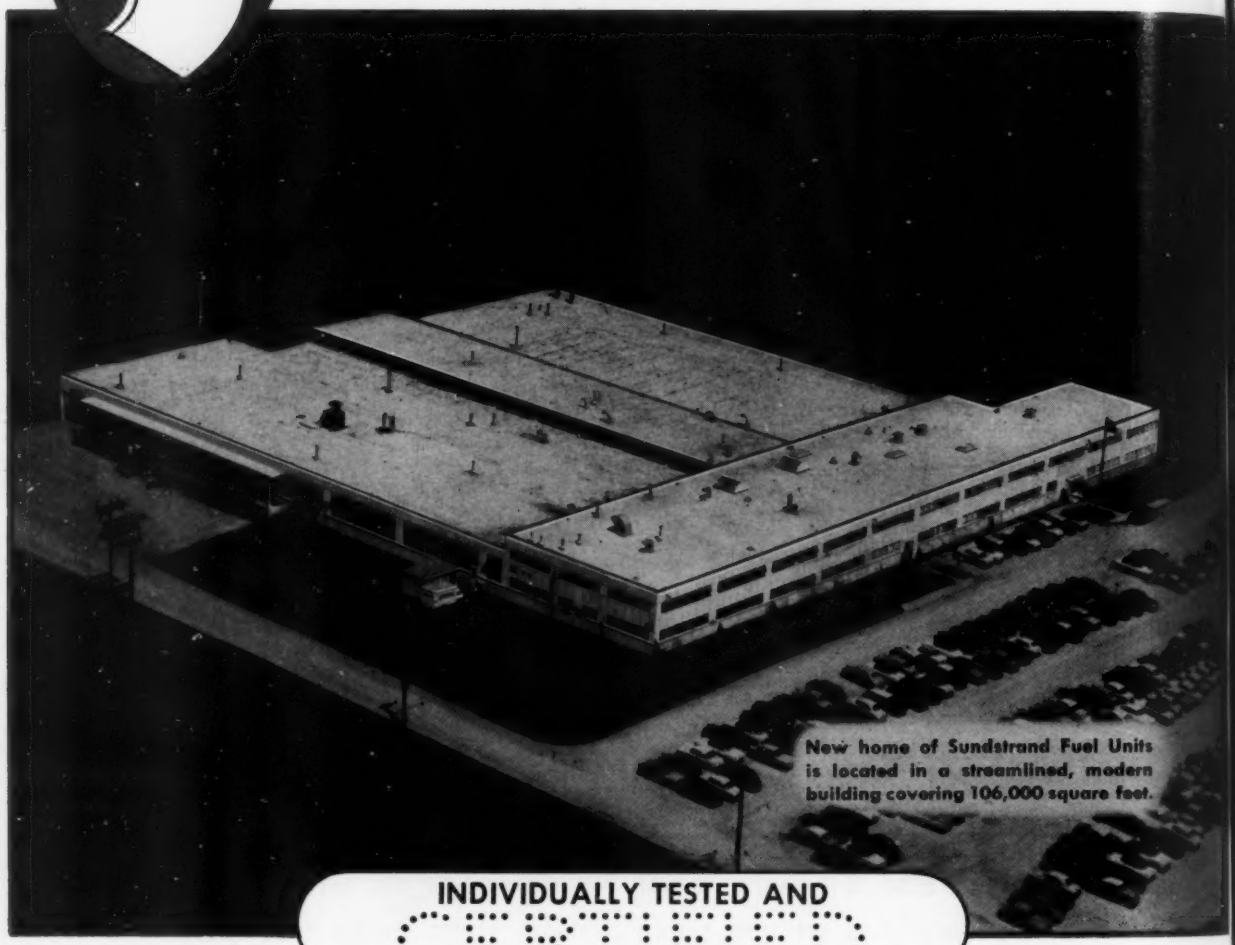
GET IT FROM YOUR JOBBER

**m I D C O**

**REGISTER CORPORATION** 1059 GRAND AVE., ST. PAUL 5, MINNESOTA

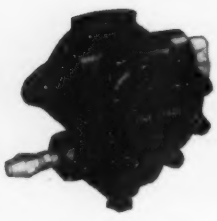
SUNDSTRAND

# Moving into modern, highlights Sundstrand's

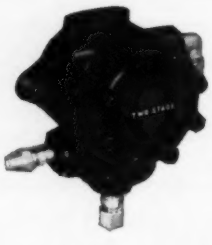


New home of Sundstrand Fuel Units is located in a streamlined, modern building covering 106,000 square feet.

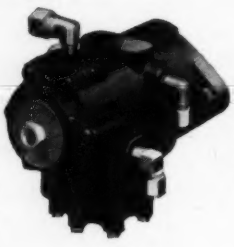
INDIVIDUALLY TESTED AND CERTIFIED



**Model J** (left)—high-pressure, single-stage, for single-pipe or two-pipe installations. 3, 6, 10, 14, and 20 gph.



**Model H** (left)—high-pressure, two-stage, for long-line, high-lift, with vacuum up to 20". 3, 6, 10, 14, and 20 gph.



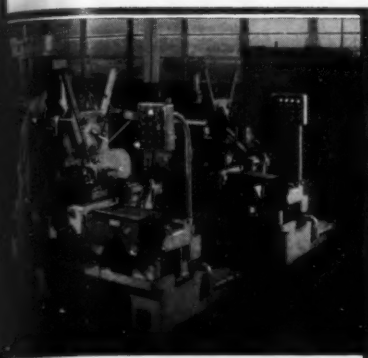
**Model AT** (left)—low-pressure, two-stage, high-lift, with vacuum up to 20". .4 to 1.5 gph.

MEMBER OIL-HEAT INSTITUTE OF AMERICA OHI

# SUNDSTRAND

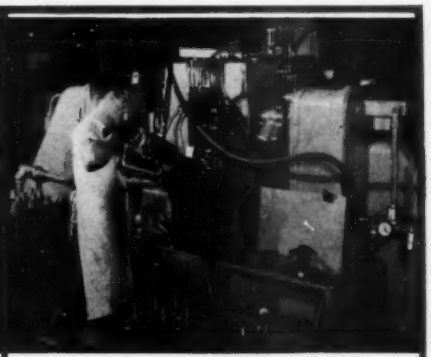
## FUEL UNITS •

# new home for fuel units
# 50TH anniversary celebration!



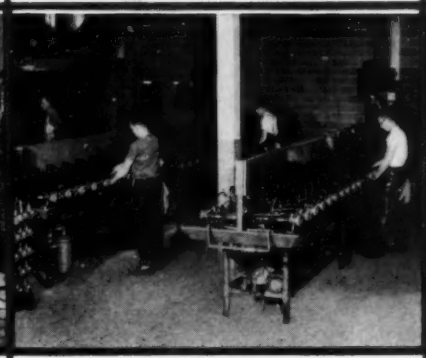
**Automation**—two inter-connected Sundstrand Automatic Lathes not only turn both faces and the inside and outside diameters of the rotor housing, but inspect the part after each operation and reject all imperfect housings.

**Battery of 10 Screw Machines,** part of 114 modern production machines in the new Sundstrand plant. Many of these machines are designed specially for fast, economical, precision manufacture of fuel unit parts.



**One of a series** of specially designed machines for extremely accurate manufacture of fuel unit parts. Here the piston sleeve opening is finished, the inlet and return port openings drilled and tapped.

**Sub-assemblies** are fed to this main assembly line on a carefully planned and timed basis. Units move along from one station to the next for assembly operations, emerging as completed fuel units, ready for run-in tests.



**Instead of "spot-checking,"** each Sundstrand Fuel Unit is run-in for 2½ hours under pressure, then individually tested for leakage, capacity, efficiency, pulsation, cutoff, power consumption, and quietness of operation.

**"Gene" Haroldson,** foreman of Assembly Department, represents the hundreds of skilled, experienced craftsmen who man the new plant. He's a 20-year man, one of many with ten years' experience or more.

Based upon more than two decades of specialized experience in manufacturing fuel units . . . and utilizing the extensive engineered production facilities of other Sundstrand divisions . . . the new home of the Sundstrand Hydraulic Division represents the "last word" in modern equipment and newest production practices.

Skilled, experienced craftsmen were moved from the old plant to the new to produce, assemble, test, and inspect. Rows upon rows of automatic machine tools form and finish parts to exacting specifications. Unique racks for run-in of equipment . . . acoustically treated booths for verifying quietness of operation . . . precision instruments for checking power consumption, pressure, pulsation, and efficiency . . . make it possible to certify the performance of each and every Sundstrand Fuel Unit.

A completely equipped laboratory assures quality control of materials, practical testing of fuel units on oil burners, and experiments on new developments.

You are invited to stop in and visit our new plant where every square inch has been utilized for more efficient, more economical output of the industry's leading fuel unit. With these new facilities, Sundstrand will provide even greater reason for being first with dealers, wholesalers, service stations, and manufacturers.

# HYDRAULIC DIVISION

***. . . a division of Sundstrand Machine Tool Co., 2210 Harrison Ave., Rockford, Illinois***

**FLUID MOTORS • STACK VALVES • LUBE PUMPS**

Made in Canada by John Inglis, Ltd., 14 Strachan Avenue, Toronto • Made in Sweden by Sundstrand Hydraulic Division AB Stockholm

# *From Honeywell* - a warm air Zone

*3-part system gives modulated heat flow with 2-position thermostats*

*1) New damper actuator gives new floating action*

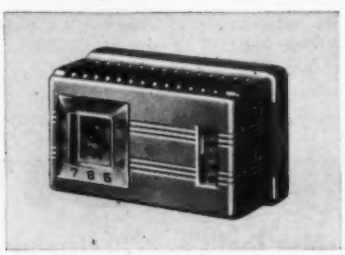
Key to the Honeywell zoning system is the newly developed M829 motor you see here. From the beginning it was designed and built for only one purpose—to make possible vastly improved warm air zoning. It does this by combining several important features. The new actuator gives true modulating control. In contrast to old-style two-position actuators it provides a continuous flow of even heat on demand. Because its action is obtained from a powerful bimetal actuator, it's noiseless in operation, has no gears or pumps to get out of order, and uses frictionless ball bearings. All this adds up to years of trouble-free service. Easy to install, it mounts in ducts in any position. And it costs considerably less than previous modulating motors.

*2) New outdoor reset control assures a uniform volume of air in all weather*

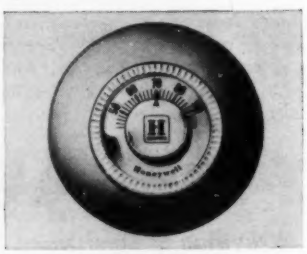
The T835A outdoor reset control operates the burner to maintain a furnace temperature according to the outside weather. For example: When it is 0° outside the control would provide a furnace temperature of 150°, when 40° outside the furnace temperature would be 110°. What this means is that the furnace supplies a continuous flow of an even volume of air at the right temperature. It is a low voltage control easy to install and simple to wire.

*3) Your choice of 3 outstanding thermostat systems*

**Electronic Moduflow**



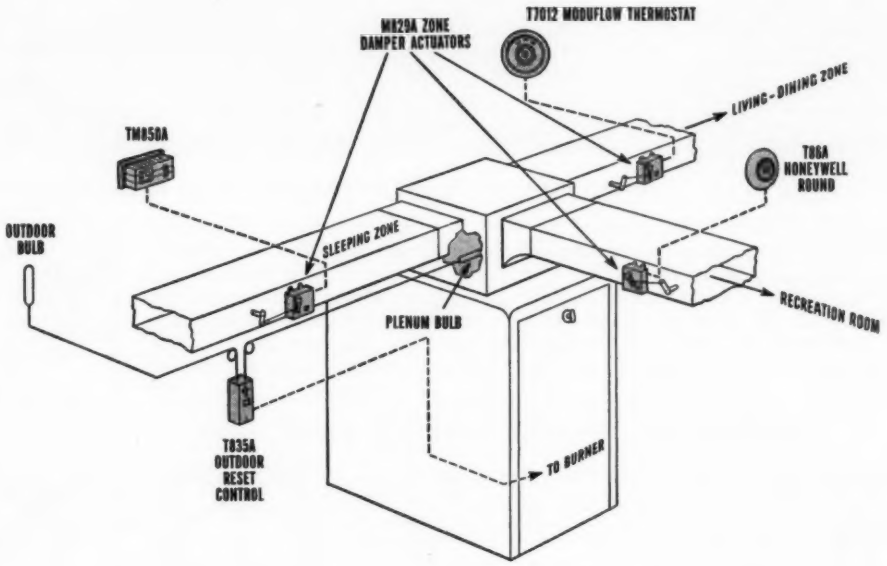

**Automatic Clock Thermostat**



**The Honeywell Round**

*For the finest in comfort, Moduflow is suggested for the major occupancy zone.*

# revolutionary new Control System




*Your best way to control zoned warm air*

Zone Control, using the new Honeywell system, is a simple and effective way to provide more comfort in every area of the modern home.

Here is how this new simple system works in the typical example of the zoned heating system shown above.

**1.** The T835 outdoor reset control operates the burner to maintain furnace temperature. It varies the furnace temperature according to the outside temperature, thus providing a constant supply of warm air for delivery to the various zones in the home in proportion to the outside temperature.

**2.** A thermostat in each zone controls the damper motor for its zone. The damper motor positions the damper to increase or decrease the air volume to meet the exact requirements called for by the thermostat. This modulating damper provides a continuous flow of heat to the zone. The combination of the outdoor reset control and the modulating damper means that both the temperature of the air and the volume directed to the zone is controlled to maintain ideal comfort conditions.

**3.** An important feature of the system provides that when all zones are satisfied the burner automatically goes off. Also, when there is a maximum demand for heat in any one zone or from all zones during morning pick-up, the burner is controlled from the high-limit, furnace control. Thus, all of the home's requirements are met.

**4.** Any regular thermostat can control the damper actuator, yet provide modulating control.

**5.** The system fills a great need in home heating controls by eliminating sudden bursts of heat and the discomfort of two position on-off heat.

*For heating and cooling*

MINNEAPOLIS **Honeywell**

**Zone Control**

*For complete information on the new Honeywell warm air zone control system, or details on wet heat zoning equipment, call your local Honeywell office. Or write Honeywell, Dept. AA-6-86, Minneapolis 8, Minnesota.*

112 OFFICES ACROSS THE NATION

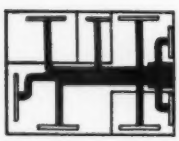
# Thermo-Base

## EXTENDED BASEBOARD AIR DISTRIBUTORS

**EASY TO SELL! . . . because it takes the forced air "feel" out of the forced air system.**

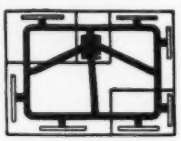
Thermo-Base gives perfect "*living comfort*" in *every* room in *any* weather. There are no concentrated blasts of air, no hot zones at the ceiling, no cold layers on the floor and no frigid fringes along the walls. Thermo-Base delivers both *radiant* and *convected* heat that is *humidified* and *filtered*. The simple styling of Thermo-Base lends a touch of good design to any interior and allows *complete freedom for furniture arranging*. Full length drapes do not interfere with operation. The cost of a complete Thermo-Base installation is comparable to that of a conventional warm air system.

### ADAPTABLE TO ANY TYPE OF STRUCTURE!

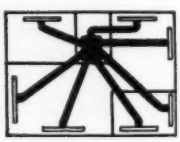


Basement

Thermo-Base is adaptable to *any* type of construction and any home, *old* or *new*. They are located on exposed walls under windows. Perimeter loop, radial feeder, individual pipe or trunkline duct systems may be used. Usually one central return air will be adequate. No roughing-in necessary.



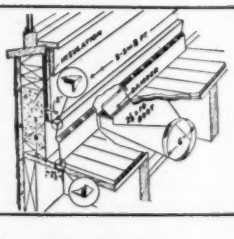
Concrete Slab



Crawl Space

### EASY AND QUICK TO INSTALL!

The illustration at right shows one way Thermo-Base may be easily installed in new construction. It is equally adaptable to old. It take *only a few minutes* to install Thermo-Base against studding, plaster board or plaster and may be set on subfloor or finished floor.



Thermo-Base . .

### . . . AVAILABLE IN 8, 5 and 3 ft. LENGTHS!

There is a complete range of units for easier, quicker installation. When desired, they can be combined for continuous coverage. Thermo-Base units are finished in a prime coat and may be painted to match the decoration after they are installed.

**Super Thermo-Base** is specifically designed to produce the greater volume of delivery required in larger installation. Available in 8 foot lengths only.

**Thermo "30" Diffuser,** America's lowest priced baseboard diffuser is available for highly competitive jobs. Available in 30 inch lengths only.

**NEW FREE CATALOG** makes any dealer a heating and cooling expert!

Send for your copy today . . . just drop us a line on your letterhead!

GERWIN INDUSTRIES, INC., Michigan City, Indiana

# FTC Calls Meeting to Define Air Conditioning

At a discussion of suggested trade practice rules prepared by the Refrigeration and Air Conditioning Contractors Association at a conference called by the Federal Trade Commission and held in Chicago on May 20, it became obvious that it will be essential to define what the "air conditioning industry" encompasses.

Paul Butts, an attorney with the FTC, and chairman of the conference, therefore called a meeting to be held in Washington on June 22, at 10 a.m., in Room 286 of the FTC building, when representatives of associations and societies interested in air conditioning will be asked to aid in preparing such a definition.

Need for a definition that will make clear that air conditioning includes heating, ventilation, humidifying, air cleanliness, etc., as well as cooling, was stressed at the Chicago session.

After the definitions have been established, a draft of proposed rules is to be made available, and a public hearing will be scheduled for the presentation of views on the proposed rules.

## *Stiglmeier Chairman Of SM Workers' Panel*

Joseph L. Stiglmeier served as chairman of the sheet metal workers' trade panel at the recent Eastern Seaboard Apprenticeship conference. Mr. Stiglmeier, secretary of the New York State Sheet Metal Joint Apprenticeship committee, is also chairman of the National Joint Sheet Metal Workers' Apprenticeship committee. Some 1500 labor and management leaders attended the conference, which was held at the Concord hotel, New York, under the sponsorship of the New York State Apprenticeship Council in cooperation with the apprenticeship councils of the six New England states and New Jersey. Scheduled for discussion by the sheet metal workers' panel were such subjects as the place of classroom instruction in the training of apprentices, the ratio of skilled men to apprentices, explosive power tools, new or modified metals in the construction industry, and new techniques for safety and speed.

## Reach New Highs In Construction

Contract awards for future construction in the 37 eastern states in April shattered many previous records, according to the F. W. Dodge Corp. The record breaking total of $2,322,085,000 was 37 percent higher than April of last year. It established the following new peaks:

- The April figure was the highest for any April in Dodge's 64 year history.
- It brought the first four months of 1955 to the highest level for any first four months in history.
- All three major categories — residential, nonresidential, and heavy engineering — set new April records and new records for the first four months.
- Residential contract awards in April were the highest ever reported in any month.

Individual April classifications were: residential, $1,070,129,000, up 34 percent over April 1954; nonresidential, $706,019,000, up 17 percent over April of last year; and heavy engineering, $545,937,000, up 88 percent over April 1954. The four month total construction figure was 35 percent above the comparable 1954 period at $7,542,497,000.

## NWAHACA Moves Into New Offices

The National Warm Air Heating and Air Conditioning Association has moved into its new offices. The address of the association is now 640 Engineers Building, Cleveland 14.

## Wholesalers Vote To Change Name

At its recent spring meeting held in Phoenix, the National Heating Wholesalers Association voted to change its name to the National Heating & Air Conditioning Wholesalers Association, Inc. The new name was chosen as more specifically defining the scope of the association's activities.

## ASHAE To Meet In San Francisco

Members and guests attending the semi-annual meeting of the American Society of Heating and Air-Conditioning Engineers to be held June 27 to 29 in San Francisco will hear technical reports on various research projects as well as a symposium on evaporative cooling conducted by authorities in this field.

Subjects to be covered include the measuring of heat flow through a test house with an analogue computer, winter design temperatures in Canada, and the calculation of heat flow through a flat roof by direct measurement.

The amount of air required to keep workers comfortable in commercial laundries, an analysis of the cause of odors in air conditioning coils, and a report on the measurement and breakdown of dust particles sampled from the air in the laboratory are other subjects scheduled to be discussed. There will be a report detailing the results of a study of

(*Continued on page 22*)

**For the profitable part of the home heating market**

**NEW UTILITY SERIES**
— gas and oil Highboys for utility room, closet or basement — wherever quality and price are important and space is at a premium. 4 models — from 75,000 to 125,000 BTUH input for gas and from 72,800 to 112,000 BTUH output for oil.

**NEW COUNTERFLOW SERIES**
— gas and oil, for perimeter heating, slab and crawl space homes. For installations where the furnace may be in or near the regular living area — where quiet operation and modern appearance are especially important 4 models — from 75,000 to 125,000 BTUH input for gas and from 72,800 to 112,000 BTUH output for oil

**NEW**

# MOR-SUN

AUTOMATIC FORCED WARM AIR

**FURNACES**

*You get so much more with MOR-SUN*

## Exclusive MOR-SUN Features that SPELL MORE PROFIT for any heating dealer

**M** Mor-Sun's all-new, engineered Heat Exchanger — fully guaranteed for 10 years. Its 50% prime heating surface and unique design are the reason for Mor-Sun's amazingly efficient, economical operation.

**O** Outer casings of all models are painted the new Autumn Haze Green — a builder-approved color with high customer appeal.

**R** Rounded edges, no sharp corners or projections complete the clean, modern appearance of Mor-Sun Furnaces.

**E** Every Mor-Sun Furnace is competitively priced to give you the maximum opportunity to close every sale — at a profit.

**P** Pre-wired, completely assembled, factory tested Mor-Sun Furnaces are easy to install — easy to service.

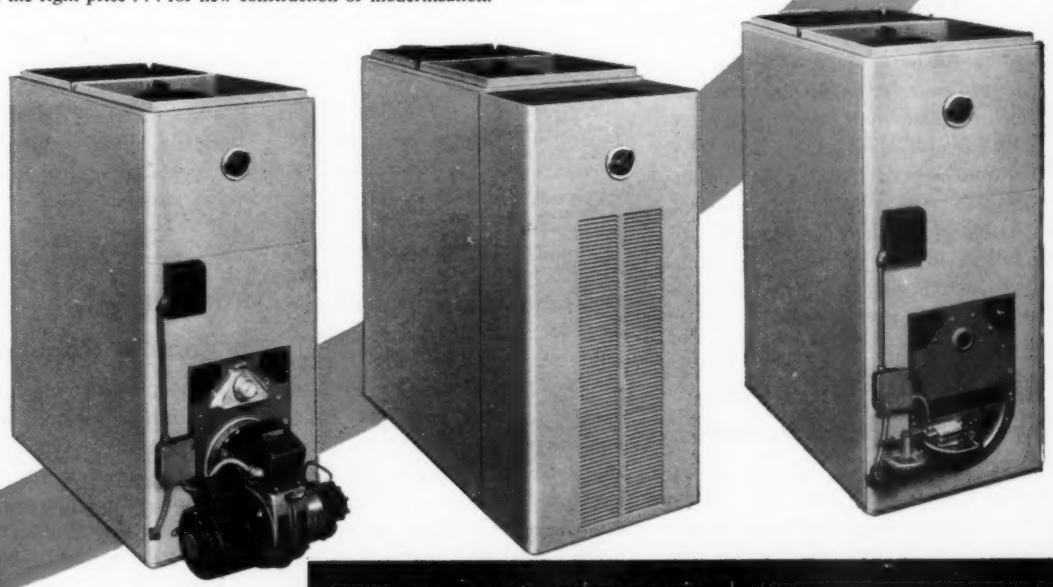
**R** Rugged, all-steel, welded construction, by the latest precision manufacturing methods is the basis for Mor-Sun quality.

**O** Oil-fired models feature a revolutionary new combustion chamber that combines the quick-heat properties of stainless steel with the durability of ceramics.

**F** Factory sponsored sales promotion — national advertising to builders and consumers — sales, engineering and service assistance — and a good co-op advertising plan — are all "plus" advantages when you're a Mor-Sun Dealer.

**I** If you're looking for a *complete* line — a *quality* line — to help you make more money . . .

**T** There's a Mor-Sun Automatic Warm Air Furnace for every home heating requirement . . . the right size . . . the right price . . . for new construction or modernization.



**NEW**
**CHALLENGER SERIES**
— gas and oil Lowboys for homes with basements. The most compact, automatic forced warm air furnaces available in their range of capacities. 3 models — from 95,000 to 125,000 BTUH input for gas and from 84,000 to 112,000 BTUH output for oil.

**FOR ALL THE FACTS . . .**
*fill in this coupon and mail today*

***Mor-Sun Furnace Division,* MORRISON STEEL PRODUCTS, Inc.**
**609 Amherst Street, Buffalo 7, New York**

Send us all the facts about Mor-Sun Warm Air Furnaces and Air Conditioners.

Name..... Title.....
Firm.....
Street.....
City..... Zone..... State.....

MOR-SUN PRESSED STEEL FURNACES

*Mor-Sun Warm Air Furnaces and Air Conditioners are distributed nationally and sold through leading heating equipment dealers everywhere.*

**Also manufacturers of ROLY-DOOR STEEL GARAGE DOORS and MORRISON SERVICE BODIES.**

(Continued from page 19)

## ASHAE Program Planned For West Coast Meeting

(Continued from page 19)

wooden louvers to determine reduction of frictional resistance to air flow and a discussion of how the sizing and location of room air outlets can change patterns of air movement.

The evaporative cooling symposium will cover such subjects as air cooling by evaporation, evaporation from surfaces, weather data limitations, geographical limitations, system design, indirect systems, and water treatment.

## *NAHB to Study Heating, AC Systems*

THE NATIONAL Association of Home Builders plans to construct a housing research village at Grand Rapids, Mich. for the purpose of testing public and industry reaction to new ideas in architecture, furnishings, etc. NAHB also plans to establish a research center at the village where heating and air conditioning systems, structural methods, materials, etc. will be studied and tested. Construction of the village is slated to begin in the early part of 1956.

## 1½ Million FHA Loans For Home Improvement

THE FEDERAL Housing Administration reports that over 1½ million borrowers in 1954 used property improvement loans insured by FHA to pay for improvements to their properties. The loans represented total advances of nearly $891 million.

The typical borrower obtained a loan of $430 to improve a single-family dwelling, and contracted to pay principal and interest in 36 monthly installments of $13.74. Home insulation was the most popular type of project financed with FHA property improvement loans last year. One out of every five loans paid for an insulation job at an average cost of $362. Loans for additions and alterations accounted for 14 percent of all loans insured in 1954. The average amount borrowed for this purpose was $917, the highest for any type of improvement. Slightly less than 14 percent of the loans were for heating, 11 percent were for exterior finish and 7 percent for interior finish.

Title I of the National Housing Act authorizes the FHA to insure qualified lending institutions against loss on loans made to finance alterations, repairs and improvements to real property and the construction of small nonresidential buildings. From 1934 through 1954, over 18 million such loans were insured, with net proceeds to borrowers totaling more than $8 billion.

## Plant and Equipment Buying Up, Consumers Also Plan More Purchases

SURVEYS of prospective demand show that business expenditures on plant and equipment are expanding and that consumers are planning to buy more durable goods and housing this year than last. The Department of Commerce and the Securities and Exchange Commission report that the decline in business outlays for capital goods appears to have hit bottom in the first quarter, approximately 10 percent below the peak in the third quarter of 1953, and is now on the upturn. For 1955 as a whole, purchases of new plants and equipment are scheduled at $27.1 billion, compared with $26.8 billion in 1954.

Businessmen on the average seem to expect a 5 percent increase in sales this year. On the whole they look for better earnings, despite the effect of keen competition on margins. Purchasing agents are taking a longer view on inventories and commitments, and delivery time on many items has lengthened out. Consequently, needs are now being covered 30 to 90 days ahead, whereas only five or six months ago most buying was in the 30 days range.

Consumers also are confident and optimistic, according to a survey conducted for the Federal Reserve Board. They feel better off financially, and plans to buy or modernize homes are greater than in any recent year.

Estimates place the nation's total output of goods and services during the first three months of 1955 close to the all-time record set in the second quarter of 1953. Thus, all — or virtually all — of the ground lost in last year's recession has been regained. The improvement is in real terms, reflecting gains in the volume of goods and services rather than price increases, for the price level is steady. This recovery has taken a much shorter time than most observers anticipated.

## OHI Urges Venting Regulation

AT THE ANNUAL meeting of the board of Oil-Heat Institute of America held recently in Chicago it was resolved that the institute recommend to Underwriters' Laboratories, National Board of Fire Underwriters, National Fire Protection Association and other bodies having jurisdiction, the adoption of a regulation concerning the venting of low heat appliances and that this regulation be inserted into national and local building codes. The suggested regulation is as follows:

*Regulation on Flues*: All low heat appliances having an output greater than 35,000 Btu per hr, or a stack temperature greater than 550 F shall be vented by an approved type chimney.

COMPLETELY NEW... AN INDUSTRY FIRST

# MOR-SUN

## AUTOMATIC GAS-FIRED VENTED RECESSED HEATER

Mor-Sun leads again — with another new extra-profit opportunity for heating dealers — the Mor-Sun Model C-70-GA Vented Recessed Heater.

Extremely compact — low in initial cost — high in adaptability and performance — the Model C-70-GA saves valuable living space by fitting into a wall opening so only its smartly louvered grille is visible. It meets the increasing demand of many builders for a low budget source of dependable, automatic warm air heat. The Mor-Sun Model C-70-GA is an excellent heating unit for all type homes in the South and for many homes in northern climates.

It is another example of the way Mor-Sun can help you get your share of the *profitable* part of the heating market.

*Here are some of the*
**FEATURES**
*that make the Model C-70-GA*
**IMPORTANT NEWS TO EVERY HEATING CONTRACTOR**

- Approved for minimum clearances to combustible surfaces when recessed in the wall.
- Conforms to all details of F.H.A. Minimum Property Requirement Pamphlets Nos. 51 and 52.
- Permits installation of Type B chimney vent.
- Capacity — 70,000 BTU/Hr. input, 52,500 BTU/Hr. output.
- Completely factory-assembled — draft hood installed — pre-wired — painted Autumn Haze Green.
- Compact — only 25" square by 52¾" high.
- Adaptable — grilles available for side wall or corner installation.
- Fully automatic — wall thermostat is standard equipment.

**OIL-FIRED RECESSED HEATER C-75-O**

Completely approved by UL for minimum clearances to combustible surfaces. Output— 57,000 BTU/Hr., input — 33 c.c.

**HEAT EXCHANGER GUARANTEED FOR 5 YEARS**

*You get so much more with MOR-SUN*

Also manufacturers of ROLY-DOOR STEEL GARAGE DOORS and MORRISON SERVICE BODIES.

*For complete details... fill in the coupon...* **MAIL TODAY**

**Mor-Sun Furnace Division**
**Morrison Steel Products, Inc.**
**609 Amherst St., Buffalo 7, N. Y.**

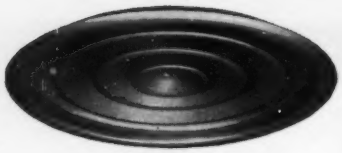
Send me complete information on the Mor-Sun Recessed Heaters.

Name.....Title.....

Firm .....

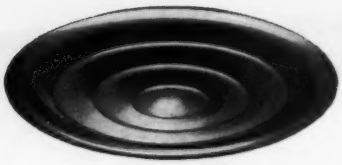
Street Address.....

City.....Zone.....State.....



TYPE PA

Adjustable pattern diffuser



TYPE PS

Stepped-down type, fixed pattern diffuser

TYPE PF

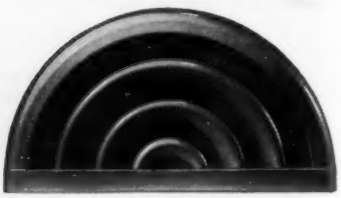
Flush type, fixed pattern diffuser

TYPE PR

Flush type, fixed pattern supply and return diffuser

TYPE PLF

Flush type, fixed pattern diffuser with light fixture



TYPE PH

Flush type, fixed pattern, half round diffuser

# Aerofuse

## CEILING DIFFUSERS

TYPE D

Flush type, fixed pattern, square diffuser

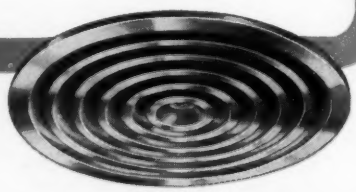
. . . a wide selection of types and sizes styled and engineered to meet rigid requirements of appearance and performance . . . *and designed for easy installation!*

TYPE ES

Stepped-down type, fixed pattern diffuser

TYPE H

Flush type, fixed pattern, half round diffuser



TYPE S

Flush type, fixed pattern diffuser

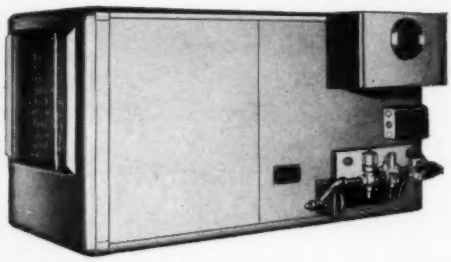
WRITE FOR CATALOG **108**

*Complete information on Aerofuse Diffusers and accessory equipment, engineering data, size selection charts, and directions for installation.*

TUTTLE & BAILEY inc

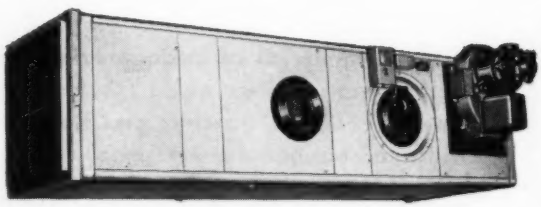
NEW BRITAIN, CONNECTICUT

# IT'S Luxaire® FOR Leadership IN HORIZONTAL FURNACES



**GAS FIRED** . . . with 65,000, 85,000, 100,000 and 140,000 B.T.U. Input

**WITH THE COMPLETE LINE OF BOTH *GAS* AND *OIL* UNITS . . . A GREATER SELECTION OF SIZES AND CAPACITIES**



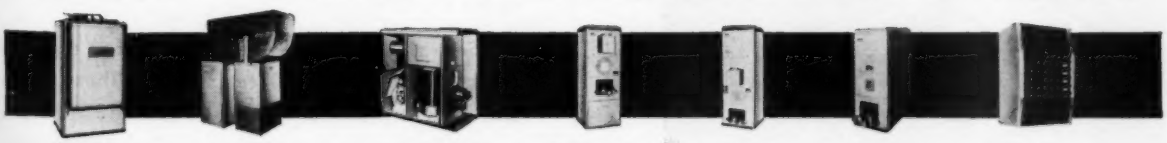
**OIL FIRED** . . . with 84,000, 100,000, 123,000 and 240,000 B.T.U. Output at Bonnet

***COMPETITIVELY PRICED ...FOR 1955 CONDITIONS***

AGAIN, Luxaire is a step-ahead in providing a more complete line of Horizontal Forced Air Furnaces. For all kinds of installations, where no floor space is available — whether for suspension overhead, or location under the floor — there is a Luxaire Horizontal Furnace for the job — a Luxaire Horizontal that is compact; is installed with ease; and provides exceptional performance. And the price is competitive, even by 1955 standards!

Now's the time to get set for leadership in your market — with the leading line of Horizontal Furnaces. See your Luxaire Jobber, today!

**THE COMPLETE . . . COMPETITIVE LINE . . . OF YEAR 'ROUND, WINTER AND SUMMER AIR CONDITIONING UNITS**



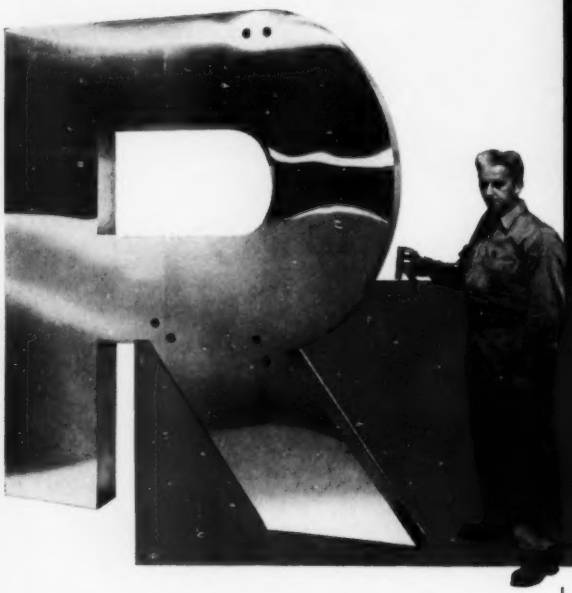
Year 'Round Air Conditioning Unit | Summer "Add-On" Air Conditioning Unit | Basement-Winter Air Conditioner | Compact Utility Heating Unit | Counterflow Heating Unit | Gravity Furnace | Gas Fired Unit Heater

THE Luxaire® C. A. OLSEN MANUFACTURING COMPANY • • ELYRIA, OHIO

*HEATING & AIR CONDITIONING UNITS*

Artisan at right is soldering to join parts of stainless letter. Your present equipment will probably be satisfactory for such jobs. Your distributor and Republic will be glad to furnish helpful tips.

There's almost no limit to the size and design of letters you can fabricate from ENDURO (below). Small "R" is 6″ high, large "R" is 9 feet.



# Build maintenance-free FROM ENDURO

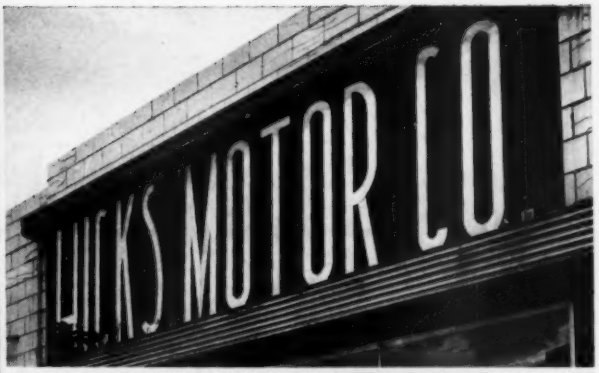
There's money to be made in bright, attractive, easy-to-maintain signs fabricated from Republic ENDURO Stainless Steel. Because merchants and businessmen are anxious to cash in on the many advantages of ENDURO, here's your opportunity to capture a bigger share of the local sign business.

It's easy to see why ENDURO signs are so popular. Customers like the "prestige look" they lend to their places of business—whether they be banks or bakeries. They like even better the long-lasting qualities that mean lower costs right down the line.

There are no large expenditures for replacement. Since ENDURO resists rust, these signs will remain beautiful through a lifetime of severe weather. Cleaning costs are rock bottom, too. Weekly bills for "polishing up the brightwork"

YOU CAN INCREASE YOUR PROFITS ON ROOF-DRAINAGE JOBS when you install ENDURO Stainless Steel gutters and downspouts made by Republic's Berger Division. Customers are attracted by such features as rust and corrosion-resistance, small maintenance, lower final cost. And installation is easy with usual tools and experience. See your distributor or send coupon for details and prices.

ENDURO MEANS BONUS BUSINESS IN RESTAURANT EQUIPMENT. Operators get exactly the advantages they want—easy cleaning, handsome appearance, good wearability. ENDURO resists rust, corrosion, abrasion, denting, heat, and heat stain; won't chip, peel or wear away. There's profit in this line.



**signs of lasting beauty**
**STAINLESS STEEL**

can be eliminated since an occasional washing quickly removes all dust and dirt. And surfaces never need to be painted.

Don't miss this chance to increase your business. Your ENDURO distributor will be delighted to discuss your local market potential—and help you get started. Just mail in coupon and Republic will send you necessary details promptly.

# REPUBLIC STEEL

*World's Widest Range*
*of Standard Steels and Steel Products*

**REPUBLIC STEEL CORPORATION**
**3162 East 45th Street**
**Cleveland 27, Ohio**

Please send more information on:
- ☐ ENDURO® Stainless Steel Sheets
- ☐ Berger Roof Drainage Products

Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

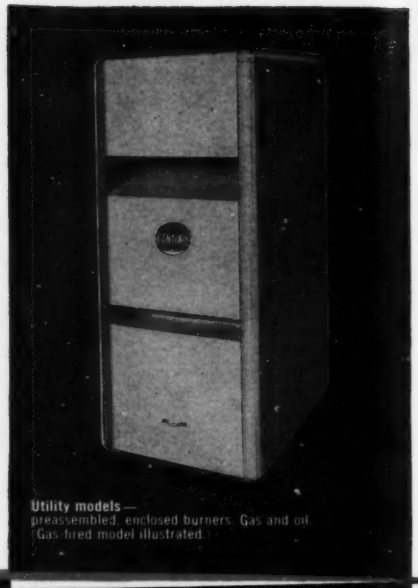
K-8672

# CENTURY

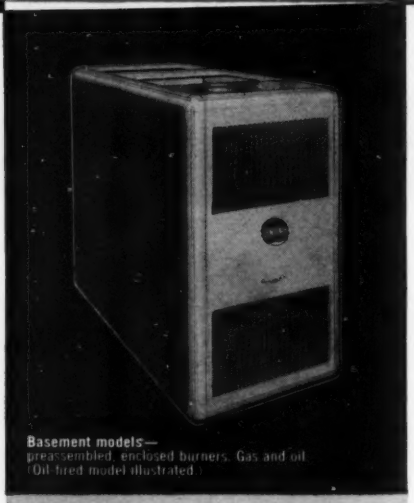
*Announces New, Low-Cost*

## Completely Enclosed Preassembled Models

**Burner Mounted and Factory-wired**



Utility models—
preassembled, enclosed burners. Gas and oil.
(Gas-fired model illustrated.)



Basement models—
preassembled, enclosed burners. Gas and oil.
(Oil-fired model illustrated.)

**So neat, attractive, beautiful!** They give you a big edge in getting the job. And these handsome new, completely enclosed Century models have all the famous Century engineering features, too. Their beauty is more than skin deep.

**Deep crescent radiators**—*spiral gas travel.* Hot gases from the combustion chamber spiral up, through and around *three* heating surfaces instead of the usual *one*. More of the heat generated heats the home, less goes up the chimney. You can show the customer simply, and clearly *why* these Century models take less fuel.

**New, improved gas and oil burners**—Completely enclosed, of course. The far-advanced Century oil burner burns all fuel efficiently, runs quietly and trouble-free. Century single-port gas burner never pops, burns clean as a pin. Approved for closet or alcove installation with minimum clearance.

**Only you can offer these features**—These new Century models are loaded with features that help *you* get the job. Find out all about them. Write to Century Engineering, Cedar Rapids, Iowa, or contact your Century wholesaler.

*All units shipped completely assembled with burner mounted and factory-wired.*

**The heating and cooling line that's "on the move." Sizes and types, gas and oil, heating and cooling, for every residential application.**

CENTURY
ENGINEERING CORPORATION
Cedar Rapids, Iowa

*Leading manufacturer of heating equipment for over 30 years*

**CENTURY ENGINEERING CORP.** AA
**CEDAR RAPIDS, IOWA**

**Gentlemen:**

**Send me complete information on your new completely enclosed preassembled models . . . without obligation.**

NAME_____

FIRM_____

ADDRESS_____

CITY_____ STATE_____

## Washington Letter

# Advisory Group Aids F H A To Establish Home Standards

**By Arnold Kruckman**

SEVEN OF the nation's top small home specialists from the architectural and engineering fields who are advisors to FHA met in Washington recently with Federal Housing Commissioner Norman P. Mason, Neil Connor, director of the FHA Architectural Standards division and his assistant, Fred W. McGhan. All members of the group are concerned with housing as a completed unit and are keenly interested in every detail and item that goes into an American home. They are not connected with any particular product in housing. According to Commissioner Mason, the meeting of this advisors group contributed "immeasurably to the advance of the quality concept in building better values into today's home."

### Cooling Standards Discussed

Of particular interest was discussion of *Bulletin ME*-12, a mechanical engineering document issued by the underwriting division of FHA, covering summer air conditioning requirements and superseding *Bulletin ME*-10 issued in 1953. There have been revisions and amplifications of the information contained in this bulletin since it was issued last year, and it was not until earlier this year that it came into any general use.

*Bulletin ME*-12 is prefaced by the statement that "the technical description, requirements and limitations expressed herein do not constitute an endorsement or approval by the Federal Housing Administration of the subject matter," the bulletin makes clear that subject to good workmanship in installation and the conditions of acceptance listed, the equipment described in the bulletin may be considered acceptable in the construction of property otherwise eligible for mortgage insurance under the minimum property requirements of this administration. It is emphasized that this acceptance applies only to installations described and is not to be construed as indicating acceptance of the property as a whole. In order to qualify as security for an insured mortgage, each property will be individually judged.

The bulletin is to remain in force until it is superseded by a new bulletin, or withdrawn. The minimum requirements are made a part of the minimum construction requirements of all FHA insuring offices.

It was made clear the objective is summer air conditioning which provides comfort in warm seasons by means of facilities which are safe, quiet, economical in operation and maintenance, and which provides temperature and relative humidity conditions within the summer comfort zone as defined and illustrated in the ASHAE *Guide*, in the specified living spaces when the outside dry and wet bulb temperatures are at design condition.

### Equipment is Permanent

Equipment and appurtenances are to be designed for and installed as a permanent part of the structure and shall include, in general, a distribution system serving, as a minimum, the living room and any adjacent spaces not separated by doors, and at least one bedroom. The system is to be so arranged that sufficient cooling capacity can be directed to the bedroom to produce specified conditions in that space. Unit conditioners designed for installation in walls are considered acceptable; however, units mounted in windows or free standing units which do not have an extension or duct through an exterior wall are not regarded as a permanent part of the structure. The requirements do not cover evaporative cooling systems. Such systems may be accepted by local insuring offices under suitable conditions.

The minimum capacity of equipment must be sufficient to produce the specified inside design conditions within the living room and any adjacent spaces not separated by doors,

(*Continued on page* 32)

# . . . the industry's most complete yearound air conditioning line

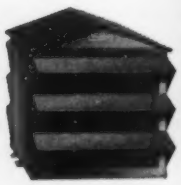
Duct Type Cooling Unit

Assure yourself profits 365 days a year. Offer your customers a choice of more than 140 heating and cooling units . . . all featuring the most modern developments and design . . . to fit any type or size house.

Get your furnaces, fittings and cooling units *all from one source* under one brand name . . . WILLIAMSON. Let us show you in detail how comparison proves WILLIAMSON selling superiority all year 'round.

# WILLIAM

HEATING &



Compressor Unit

Counter-Flow Heating and Cooling Unit

Space Cooling Unit

## COMPLETE HEATING LINE . . .

- GASAVER and OILSAVER Deluxe Furnaces . . . 1st really new feature in warm air heating in last quarter century. Lo-Boy, Hi-Boy, Gravity
- FLO-WARM Gas, Oil and Coal Furnaces . . . highest quality at price unmatched for value per dollar. Lo-Boy, Hi-Boy, Counter-Flow, Horizontal
- ASSEMBLED Gas and Oil Furnaces . . . WILLIAMSON quality at competitive prices—factory assembled, wired and tested. Lo-Boy, Hi-Boy, Counter-Flow, Horizontal.

## COMPLETE COOLING LINE . . .

- . . . WATERLESS AIRefrigeration with unsurpassed efficiency—featuring exclusive Counter-Flow or Duct Evaporator cooling that requires no additional floor space in a slab perimeter or basement house.
- . . . WATER-COOLED Units that need only 2.7 sq. ft. of floor space.
- DUCT, PIPE AND FITTINGS for any Heating or Cooling System . . . die-cut, pre-fabricated.

*act for profits everyday!*

**THE WILLIAMSON HEATER CO.**
3581 MADISON ROAD, CINCINNATI 9, OHIO

*Gentlemen: Rush me details on WILLIAMSON year 'round profits.*

Name.....Title.....

Firm.....

Address.....

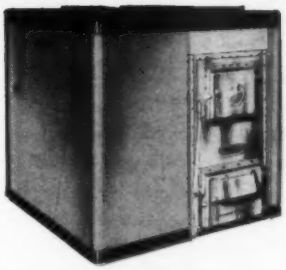
City.....Zone.....State.....

*Nationally Advertised in . . .*

Gasaver Lo-Boy

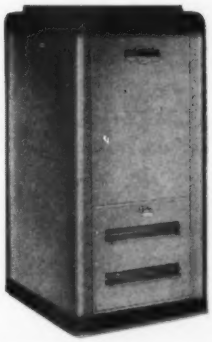
Oil Flo-Warm Horizontal

Assembled
Gas Horizontal

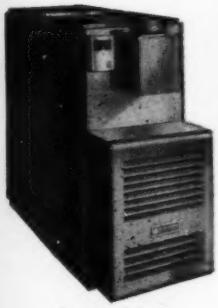


Coal Flo-Warm

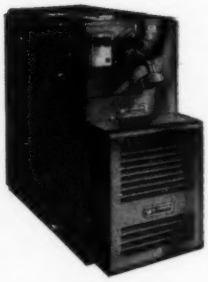
Oilsaver Lo-Boy



Gasaver Gravity



Assembled
Gas Lo-Boy



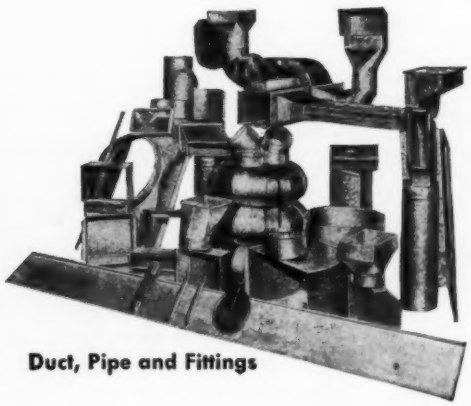
Assembled
Oil Lo-Boy

Assembled
Oil Hi-Boy

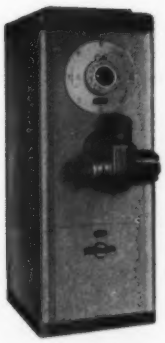
Assembled Oil
Counter-Flow

Assembled
Gas Hi-Boy

Gas Flo-Warm Lo-Boy



Duct, Pipe and Fittings



Oil Flo-Warm
Hi-Boy

# WASHINGTON LETTER—

(*Continued from page 29*)

when the outside DB and WB temperatures are at design level. Data to be submitted are building construction details pertinent to heat gain calculations and complete plans and specifications of the proposed system. Heat gain calculations, including estimated heat gain and Btu extraction for each space to be conditioned are to be submitted. Also, the cost of installed system and estimates of annual operating and maintenance costs are to be supplied. Where summer air conditioning systems are combined with heating systems, the above costs should reflect only the additional amounts for the summer air conditioning unit.

### Use Methods Available

Heat gain calculations should be made in accordance with the ASHAE *Heating, Ventilating, Air Conditioning Guide*, Air Conditioning and Refrigeration Institute standards, the applicable manuals of the National Warm Air Heating and Air Conditioning Association or other recognized and acceptable methods. Outside and inside design conditions are to be specified. Outside conditions should prescribe the DB and WB temperatures as listed in the ASHAE *Guide* under *Design Dry Bulb and Wet Bulb Temperatures in Common Use* for the city station. For localities not listed in the guide the outside design temperatures will be established by FHA. Inside conditions will prescribe the DB temperature and the relative humidity. Inside design conditions in excess of 80 deg DB and 50 percent relative humidity are not generally recommended.

Tubing used for conveying condenser cooling water must be galvanized, copper, or other corrosion-resistant material acceptable to the chief underwriter. Where condenser cooling water causes excessive corrosion, scaling or obstruction within the piping or equipment, suitable water treatment means may be required. Cooling coils, except in units specifically approved and listed by UL or AGA for location of coil upstream from furnace heat transfer surface, shall be located so that conditioned air leaving the coils will not pass over the heat transfer surface of any furnace. The cooling coil may be located downstream from the furnace, or the furnace may be bypassed during the cooling cycle.

### Protection, Clearances Specified

All exposed refrigeration tubing located less than 6 ft above any floor or outside grade shall be suitably protected to prevent damage to tubing or injury to persons. Clearances are to be provided from all construction to permit proper operation, adjustment, and repair of equipment.

Suitable means are to be provided for the disposal of condensate from the equipment. The condensate drain must be at least ¾ in. nominal pipe size and is to be of copper, galvanized steel, or other corrosion-resistant material. Where the cooling coil or air conditioning unit is located above a living space, or where structural damage may result from condensate overflow, an additional watertight pan of corrosion-resistant metal shall be installed beneath the cooling coil or unit to catch overflow condensate resulting from a clogged condensate drain. The pan is to be provided with a drain pipe, minimum ½ in. nominal pipe size, discharging at a point which can be readily observed. Condensate drains must not be directly connected to a plumbing drainage system.

In discussing distribution it was emphasized that duct systems should be designed and installed in accordance with a recognized and acceptable method such as contained in the ASHAE *Guide* or applicable manuals of the NWAHACA except as otherwise may be required. Return air from any living unit cannot be recirculated and delivered to any other living unit. Balancing devices for volume adjustments are to be provided in each supply duct or supply outlet. In combined systems where the same ducts are used for heating and cooling, supply outlets are to be provided with suitable directional vanes, and where necessary to achieve proper distribution, vanes shall be adjustable, and supply outlets in bedrooms shall be provided with a shut-off damper. Warm air heating system ducts of course must be larger if they are used also for cooling.

Grilles for return air are to be sized so that the velocity of air through free areas will not exceed 500 fpm. Return air inlets must be of sufficient number and so located that return air from one room will not pass across normally occupied floor areas of another room in such manner as to cause draft.

### Insulation Must Be Adequate

Supply ducts and piping in crawl spaces, unfinished attics and other non-conditioned spaces shall be suitably insulated. Where necessary, ducts and other parts of the distribution system shall be insulated and covered with a sealed joint vapor barrier to prevent condensation. An acceptable ground cover should be provided in crawl spaces of any structure in which air conditioning is installed.

Suitable and durable means must be provided to prevent transmission of objectionable noise or vibration generated by the cooling equipment. As a partial indexing guide, the sound level due to the operation of the equipment, as measured on the 40 decibel weighted network in the center of conditioned spaces and 3 ft above the floor, should generally be no higher than 45 decibels for a normally furnished room or 50 decibels for an unfurnished room.

The manufacturer's wiring diagram is to be supplied for packaged units. Where field assembled units are installed, a complete wiring diagram is to be submitted. Compressor motors must be installed on 208, 220 or 230 volt circuits unless specifically

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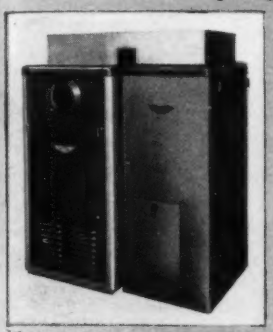
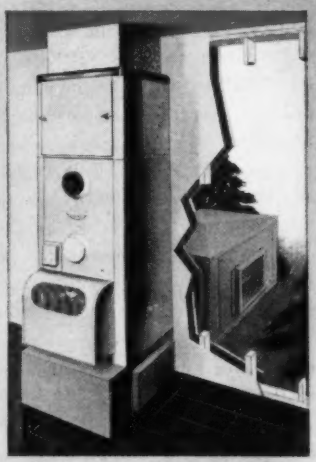


Vertical water or air cooled companion basement model



Horizontal water or air cooled model for utility room installation

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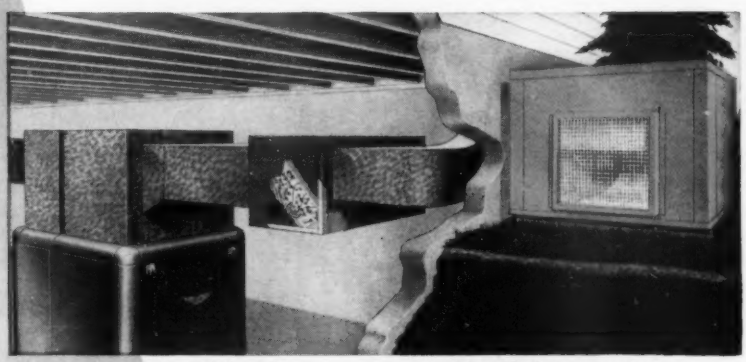

Remote air cooled condenser—compressor model, with duct evaporator

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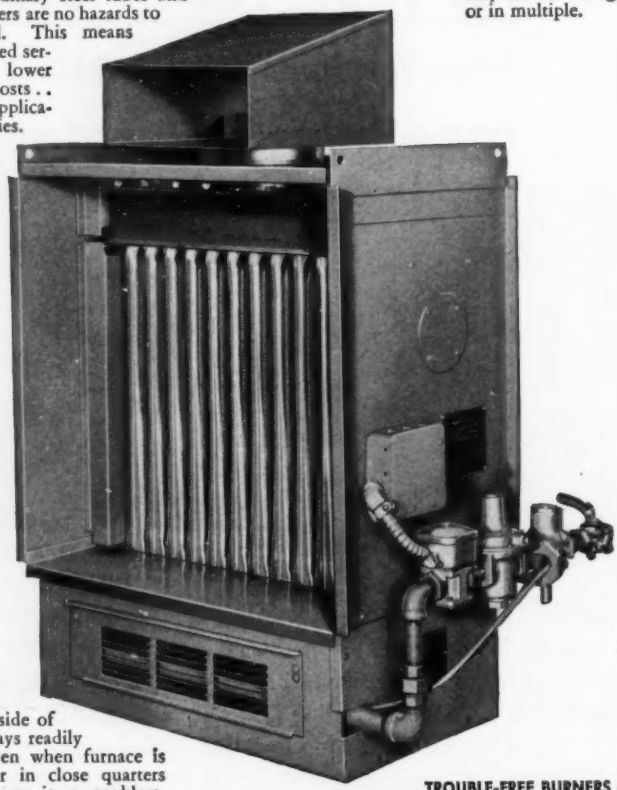

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exempted by the chief underwriter. All electrical wiring must comply with the requirements of the National Electrical code. All motors are to be protected in accordance with recommendations contained in Underwriters' Laboratories, Inc. *Standard for Air Conditioning Equipment, Subject* 207 (*a*), latest revision. Operating and maintenance instructions are to be provided for each installation and attached to applicable equipment or adjacent to it.

### Guarantee Required

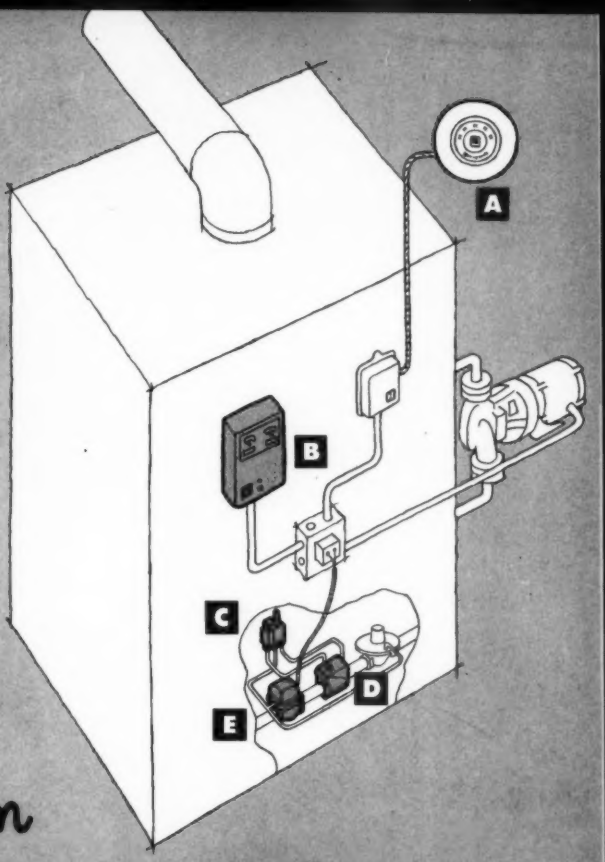
A performance guarantee including evidence of adequate service facilities, acceptable to the chief underwriter and executed by the contractor installing the equipment must be part of the contract specifications. Standard Manufacturers' warranty will be required for all equipment. Warranty replacement parts are to be furnished and installed by the contractor without additional charge during the first year after date of installation. Equipment carrying a manufacturer's warranty in excess of one year must be plainly denoted in the submission.

A point in line with this discussion of the air conditioning equipment connected with warm air heating is a recent directive of the FHA which reads:

"Every forced warm air furnace shall be equipped with a temperature-actuated fan control. The control shall cause the fan to operate when air in the supply plenum (or any supply duct), or in the return plenum (or any return duct) reaches the temperature of the maximum fan setting of the control and continue to operate until the temperature of the air in the supply plenum or duct reaches the lower fan setting.

"The fan control shall be so constructed that the maximum fan setting cannot be above 200 F. Except for gas fired furnaces equipped with self-generating controls, a manual disconnect switch shall not be installed in the fan electrical circuit unless such switch also cuts off the burner."

typical all-Honeywell control system




**A** **Thermostat, T86, the Honeywell Round.** Among manual thermostats, your customers' choice for world-famous styling . . . your best bet for trouble-free accuracy. Sealed mercury switch means no dirty-contact problems. One adjustable heater works with all primary controls.

**B** **Triple Aquastat, L6010A,** reliable three-in-one unit provides high and low limit for burner plus low limit for circulator. Needs only one boiler-tapping for use in any boiler, and Honeywell's MICRO SWITCH precision switches permit use in low-voltage, line-voltage or Powerpile circuits.

**C** **Pilot Burner, Q305,** a "single port" pilot. Same flame lights burner and heats Pilotstat thermocouple. No danger of delayed ignition and less chance for clogging. A low BTU burner, too . . . saves money for your customers.

**D** **Pilotstat, C588,** in case of flame-failure cuts off gas flow to both pilot and main burner and requires manual reset. Contains automatic safe-light feature to prevent flow of gas to main burner while pilot is being relighted. Can be used with all types of gases.

**E** **Gas Valve, V87.** See description below.

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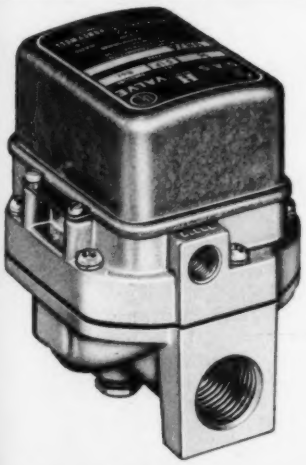

**Gas Valve, V87,** Honeywell's new low voltage diaphragm valve provides quieter performance at lower cost. Spring-loaded diaphragm of nylon-reinforced synthetic assures long life and tight closings. Convenient terminal panel eliminates need for splicing. Extra large pilot-valve porting . . . no special filters needed. Meets S.U.R. requirements. One model for all gases.

### *1. Your installation works better*

Every Honeywell control is "system-engineered" to work with other Honeywell controls. This gives you maximum system efficiency.

### *2. You have the widest choice of controls and systems*

Only Honeywell makes control systems for every type of heating plant and for all fuels. When you go all-Honeywell, you get the right system for every job. You're able to rely on *one supplier for all your controls.*

### *3. You get the best field service in the country*

Need help in a hook-up? Puzzled by a performance problem? Your best and nearest answer is your Honeywell wholesaler or branch office. 70 years' experience in controls alone . . . plus the biggest field organization of all . . . puts *more control know-how at your service* from Honeywell than anywhere else in the heating industry.

### *4. You make more money*

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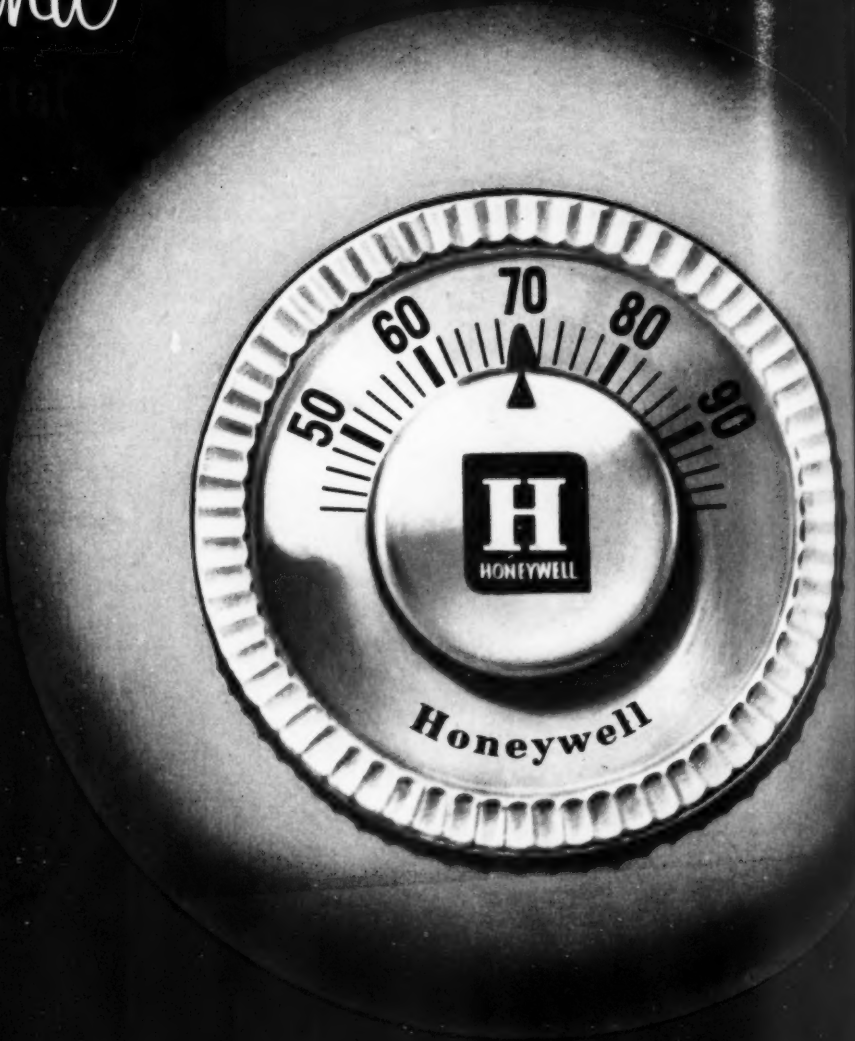
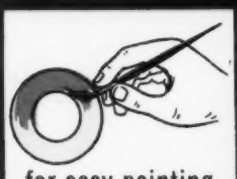


Cover snaps off . . .



for easy painting to match any wall.

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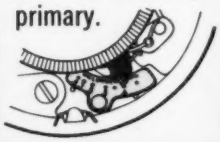

Dust-free mercury switch gives quick, positive switching.

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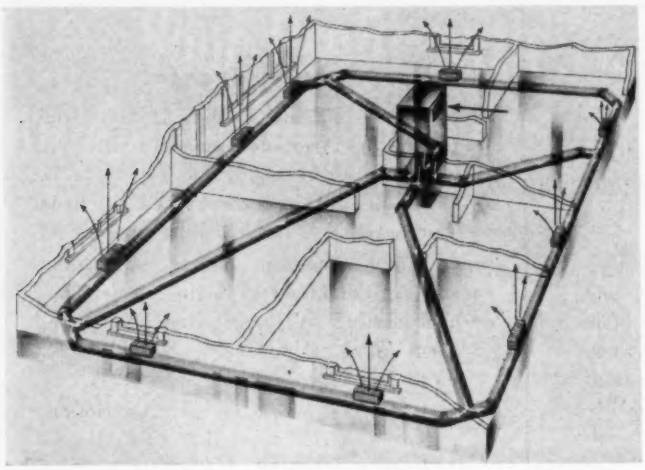

PERIMETER LOOP heating system that has proved to be the most successful type when used with a slab floor construction

CHECKING heating system layouts are (from left) Robert J. Waalkes and Herbert T. Gilkey

# Comfort — Key to Upgrading the Industry

**Skills and services of the heating dealer become evident to the home owner as he enjoys the environment of his home when it has been year 'round air conditioned**

YEAR 'ROUND air conditioning can make heating and cooling "a more important part of a house and can 'upgrade' the entire industry," said Claude A. Potts, of the U. S. Machine Div., Stewart Warner Corp., chairman of the air conditioning panel session at the Oil-Heat Institute's 33rd annual convention in Chicago, and a vice president of the OHI. Sales of room and window air conditioners "have paved the way" for sales of central residential cooling, he said, as radio paved the way for TV. We just don't live today without TV; the same will be true regarding central home cooling, he believes.

This session was strictly a heating and cooling session. Not one of the speakers mentioned fuel oil or oil burners.

The panel members described "liquid" heating and cooling systems and warm air heating and cooling systems for homes. In the discussion of liquid systems, it seemed obvious that present thinking is to keep the cooling entirely separate from the heating; whereas, with warm air, the cooling and heating functions are largely combined, as the duct system can be used for distribution of both cooled and warmed air. According to Prof. Warren S. Harris, of the University of Illinois, the studies in a "wet heat" research residence there this summer will involve a cooling installation using fan-coil units and ducts entirely separate from the hot water heating system in the house. Later, in answer to a question from the audience on how to convert an existing hot water heating system for cooling, he said this was almost impossible; while each job must be studied individually, he believed that in general the use of fan-coil units and ducts, separate from the heating, was indicated in a situation of this kind.

### Superior Adaptability of Warm Air System

In contrast, a warm air heating system in a home is easily and economically supplemented to provide

year 'round air conditioning. Herbert T. Gilkey, at the time also of the University of Illinois but now of the National Warm Air Heating and Air Conditioning Association, pointed out that the primary purpose of any type of heating system is to heat the air. Following him, Robert J. Waalkes, until recently at Michigan State University and now with Hart & Cooley Mfg. Co., explained the addition of cooling to warm air heating.

Mr. Gilkey said that the perimeter heating system, with warm air introduced at the outside walls and the returns on the interior walls (either low or high, as tests have shown no major differences in room air temperatures) seems to him the most important type for all kinds of houses and construction. He recommended the NWAHACA's Manual 3 for calculating heat losses, which is based on the ASHAE's Guide, and Manual 4 for designing the heating system itself. Manual 10 should be used, he said, if it is desired to use only one size of duct (4 in.) for crawl space but not slab houses.

The perimeter loop system is "very satisfactory," he said. He described the perimeter radial system as "the poor man's perimeter loop," as the floor temperatures with it are "much lower."

### "Don't Blame the Heating System"

Anytime anything goes wrong, it is the heating system that's blamed, he stated. The heating dealer must therefore be assured that the building construction is proper. He stressed that slab construction must have edge insulation, gravel fill, and a good vapor barrier under the slab. A crawl space perimeter system does not need a loop around the exterior walls, but warm air should be introduced into the crawl space, he said.

To indicate the importance of a vapor barrier with crawl space construction, he reported that Department of Agriculture tests had indicated that more moisture was evaporated from a soil surface than from an equal area of open water.

He predicted that perimeter heating will be used more and more. A heating system is an essential part of a house, and the sooner the heating contractor gets into the picture in regard to building insulation, vapor barriers, storm windows, etc., the better will be the heating and the owner's comfort.

Discussing cooling with warm air installations, Mr. Waalkes said there is a trend to the quality house these days — including better and "more automatic" heating and cooling. He mentioned, for example, great interest in several Michigan cities in central cooling.

(*Continued on page* 40)

### *Coming Events*

June 23-25—Carolinas Roofing & Sheet Metal Contractors' Association, annual convention. Ocean Forest Hotel, Myrtle Beach, S. C. Julian McKeithan, Secretary, Andover Iron Works, 112 N. Water St., Wilmington, N. C.

June 27-29—American Society of Heating and Air-Conditioning Engineers, semi-annual meeting. St. Francis Hotel, San Francisco. A. V. Hutchinson, Secretary, 62 Worth St., New York 13.

Aug. 4—Chicago Warm Air Golf Association, golf meet. River Forest Golf Club. Melvin A. Jackson, President, c/o Wolverine Tube Div., Calumet & Hecla, Inc., 1580 Sherman Ave., Suite 406, Evanston, Ill.

Sept. 27—Chicago Warm Air Golf Association, golf meet. Ruth Lake Country Club. Melvin A. Jackson, President, c/o Wolverine Tube Div., Calumet & Hecla, Inc., 1580 Sherman Ave., Suite 406, Evanston, Ill.

Nov. 27-29—National Heating & Air Conditioning Wholesalers Association, Inc., fall annual meeting and convention, New York. Wilbur R. Bull, Executive Director, 1200 W. Fifth Ave., Columbus, O.

Nov. 28-29—National Warm Air Heating and Air Conditioning Association, board and committee meetings. Hotel Statler, New York. George Boeddener, Managing Director, 640 Engineers Bldg., Cleveland 14.

Nov. 28-Dec. 1—Air-Conditioning and Refrigeration Institute, 9th Exposition of the Air-Conditioning and Refrigeration Industry. Atlantic City, N. J. George E. Mills, show director, 9th Exposition of the Air-Conditioning and Refrigeration Industry, 1346 Connecticut Ave., N. W., Washington, D. C.

Nov. 30-Dec. 1—National Warm Air Heating and Air Conditioning Association, annual convention. Hotel Statler, New York. George Boeddener, Managing Director, 640 Engineers Bldg., Cleveland 14.

Jan. 23-25—American Society of Heating and Air-Conditioning Engineers, Inc., annual meeting. Sheraton-Gibson Hotel, Cincinnati. A. V. Hutchinson, Executive Secretary, 62 Worth St., New York 13.

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The problem of designing and installing central cooling is basically the same as with warm air heating, with additional factors to be considered, he said. Sun load — a big factor in cooling — must be allowed for. The color and construction of roofs is becoming more important in northern areas (light colors reflect heat more than dark ones do), as are wall construction and wall finishes. Dehumidification must of course be carefully considered, as must internal heat loads, which help a heating system but add to a cooling system's job.

All warm air duct systems can be used for cooling, he said. There is no problem of drafts with perimeter location of registers, but the dealer must be a little more careful with cool air to get adequate velocities so the air won't spill over and cause drafts in occupied spaces, he warned.

In some cases, the air required for cooling may be about twice that needed for heating; in other cases, the two quantities balance out almost exactly, he stated. If a job is "well out of balance" on air quantities for cooling as compared to those for heating, the system can be designed with an extra duct run or runs for cooling use, a bypass can be used so the system circulates at all times the cooling air quantity but bypasses some of the air around the furnace during heating, or multiple speed or multiple blowers can be employed. There are many ways to solve this problem, he remarked.

### "Do Not Oversize Cooling Equipment"

All speakers stressed the importance of not oversizing cooling equipment, as if the compressor cycles too often, higher humidities will result in the house. Mr. Gilkey suggested the advisability of the blower cycling with the compressor to improve the house humidity. This minimizes the re-evaporation of water from the cooling coil when the refrigeration is off. The best answer, though, is a slightly under-sized compressor which will run for longer periods, he said.

All sources of moisture load should be controlled. Vapor barriers should be used. Clothes dryers should be vented. In one case, a cloth shower curtain contributed greatly to the moisture load; a plastic curtain corrected this particular difficulty.

Cooled air should not circulate through a furnace unless the heat exchanger is specially treated or of special construction to withstand the effects of corrosion due to condensation, Mr. Gilkey said in answer to a question.

# See Big Home Heating, Cooling Market for Many Years

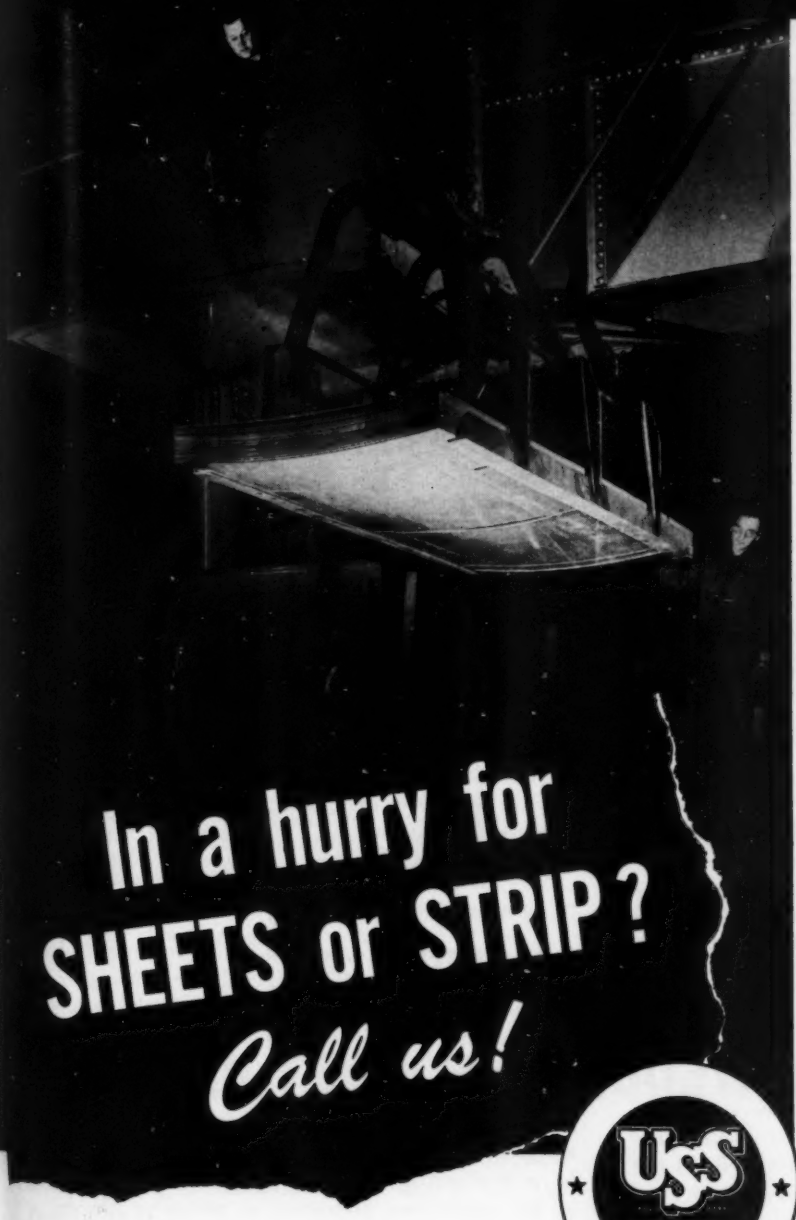
**One million to 1.2 million new dwelling units a year until 1960 — and after that, an *increase* . . . . . Home improvement opportunities twice the new home market**

BOTH THE NEW HOME and the old home potentials for many years to come indicate tremendous opportunities for heating and air conditioning installations, according to speakers at the opening session of the Oil-Heat Institute's 33rd annual convention at Chicago. And new developments may be expected, too — for example, C. H. Chalmers, of the Chalmers Oil Burner Co., an industry pioneer, said that "atomic energy is here to stay, and will be used for heating," when invited by the chairman to comment informally.

George E. Hochstein, OHI's new president and sales manager of The Heil Co., Milwaukee, presided at the opening session.

Richard Canavan, of the National Association of Home Builders — who predicted the 1 million to 1.2 million per year housing starts — pointed out that home building changed to a big industry "almost overnight"; that is, within the last 10 years. Home builders today are primarily businessmen skilled in finance, production, and merchandising, he said.

He had several suggestions on how heating men



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can aid home builders. The heating man should keep his home builder customers informed of heating trends, new products, etc. The popular basementless houses put great stress on compactness of heating equipment — including the not-to-be-forgotten and necessary space for servicing the heating installation. In merchandising a house, the builder must point out its good qualities. He therefore needs information on the heating features, as well as material he can put into a kit for the home buyer on the care and maintenance of the heating equipment.

### Builders Must Sell Quality

The home builder must wind up with "a package at a price." A problem he faces is how to sell quality — including the quality of the heating system. Will, for example, the FHA or the VA valuation reflect a superior heating installation? he asked. Builders are and must be very cost-conscious; they are also "well-aware" of homeowners' troubles. Heating dealers and distributors therefore should merchandise the service they can give to home builders and owners, he said.

The custom builder and the residential architect should not be overlooked by heating men, he stressed, especially on new products. Not only are they "flexible," making it possible for them to incorporate new things, but they also set the trends for the speculative builders.

Of the new housing starts he predicted, he said that one-half to two-thirds would be required because of new families and the rest to replace homes and allow for undoubling and outgrowing of present quarters. In addition, he sees up to 600,000 remodelled units. There are twice as many homeowners in the U. S. today as there were in 1940, he said.

### "Terrific" Modernization Market Predicted

In thanking Mr. Canavan, Mr. Hochstein said there is room for improvement in selling the value and economy of good heating, and that the market is "terrific."

At the same session, Ferd Kramer and Henry Bernhard explained the ACTION (American Council to Improve Our Neighborhoods, Inc.) program. This program is a "ray of hope" to the building industry if new housing starts should drop off. Eight million (out of 43 million) dwelling units have already "succumbed to the slums," according to their slide film presentation. One-half of the houses in the U. S. are over 30 years old; there are no mortgages on one-half our houses, and the average owner equity for the other one-half is 50 percent. The opportunities ($10 to $15 billion a year) for home improvements are thus tremendous. The ACTION program, "which cannot succeed without the support of all elements of the business community," cannot only rehabilitate houses but lives as well (by eliminating slums), said Mr. Kramer.

The importance of the right "business climate" to the realization of the tremendous new home and modernization markets predicted by the other speakers was stressed in a most interesting and well done sound film produced by the U. S. Chamber of Commerce and the du-Pont company. Titled "It's Everybody's Business," the film explains the importance of a constant flow of savings dollars into our business system each year, and the dangers of excessive taxation.

NEW PRESIDENT, Oil-Heat Institute of America, George E. Hochstein

### "Engineers Make Good Managers"

The importance of good engineering for every job was pointed out by I. Wayne Premer, Manager, Heating Div., Hager-Fox Co., Lansing, Mich. dealer, Mr. Premer said that his company had started in business doing exclusively new house work. Since 1947 they have gradually expanded to include replacement work. The firm has grown to 48 employees and four basic departments. Each department is headed by a graduate engineer who follows the principles of the engineering profession in managing his department. Mr. Premer feels that the success of the company is directly related to the attention given to engineering each installation to achieve the best results obtainable from the equipment used.

An 8 to 10 percent increase in sales of oil fired heating equipment this year over 1954 was predicted by the OHI at the convention. Featured luncheon speakers included the Rev. Lex King Souter, pastor of the First Congregational church, Fall River, Mass., and Douglas McKay, Secretary of the Interior, who said that in his opinion American business today needs salesmanship more than anything else. The mayor of Chicago had proclaimed "oil heat week" in the city during the convention, pointing out that "the world's first oil burners" had been used to heat buildings at Chicago's World Columbian Exposition in 1893.

*(More association news on page 44)*

Shown here are air ducts, 58″ x 66″ and 38″ x 38″, of the Atlantic City Convention Hall, which are insulated with aluminum-foil-faced Super·Fine. This job was handled by the Triangle Insulation Company, Inc., of Philadelphia, Pa.

# L·O·F Glass Fibers Super·Fine can reduce installation costs 30%

When you're after an air-conditioning contract, a big saving in insulation cost can be mighty important.

Provided, of course, your insulation material is as good or better than that offered by competition.

**Here's a case in point:** The Triangle Insulation Co., Inc., installed the insulation on the new air-conditioning system at the Atlantic City Convention Hall. The job involved approximately 16,000 square feet of duct insulation.

The specifying engineer realized that L·O·F foil-faced Super·Fine offered high efficiency in insulation material together with a vapor barrier. *Most important, ¾-pound density Super·Fine could be installed at a 30% saving compared to other methods and materials.*

**Here's why installation costs less:**—Super·Fine is pliable and will conform to irregular contours. Easy to handle and apply, there's no shaping or fitting with Super·Fine.

Super·Fine's fine glass fibers will not burn or absorb moisture, will not rot or mildew. It is verminproof and rodentproof.

**FREE!** For helpful folder giving instruction in installation, write: L-O-F Glass Fibers Company, Dept. 45-65, 1810 Madison Avenue, Toledo 1, O.

L·O·F GLASS FIBERS

**L·O·F GLASS FIBERS COMPANY**

Makers of glass fibers by the exclusive "Electronic-Extrusion" process

# Sell or Give Away Service?

**Heating service can be a separate source of the dealer's income, says one speaker. Another says that free preventive service calls can lead to profits in replacement of parts, sales of complete heating installations, and of other equipment**

REGISTRATION desk of the Oil-Heat Institute of America was the meeting place for old friends from many states

"A DEALER can't sell what he gives away," said Charles Burkhardt, general manager of the Paragon Maintenance Co., Mineola, Long Island, at the Oil-Heat Institute's 33rd annual convention in Chicago. Service can be a source of separate income to a dealer, and should not be considered as merely an adjunct to the sale of equipment or of fuel, he said.

On the other hand, said Miles Mills, of Des Moines, Iowa, free preventive service calls lead to profits in replacement of parts, heating units, and sales of other equipment such as basement dehumidifiers, air conditioning, etc.

### Making Service Pay Its Way

In putting service on a "paid for" basis, said Mr. Burkhardt, the service department should be set up as a separate company or with its own cost accounting. The public should then be educated to look upon the service man as akin to a doctor, for John Q. Public doesn't expect free medical service.

Mr. Burkhardt would avoid use of the term "service contract." Instead, he would call a service plan a "product performance security plan" and rather than making a homeowner pay for a service contract, he would "enroll" him in such a plan for an annual fee, just as in the case of a service contract. The enrollment would be automatically renewable unless the customer were notified otherwise. Thus, the dealer may realize an 85 percent renewal rate. The plan should include a 30 day escape clause, contingent upon the service man's first inspection of the installation.

A label or tag should be affixed to all equipment to show the service work done. The customer should be sent a certificate of some kind, indicating that his equipment is protected by the "security plan."

### Advantages of Preventive Service

A free preventive service program is a method of getting new customers, retaining old ones, and promoting sales of replacement and additional equipment, according to Mr. Mills. His company has cut its service personnel in half since stressing preventive maintenance.

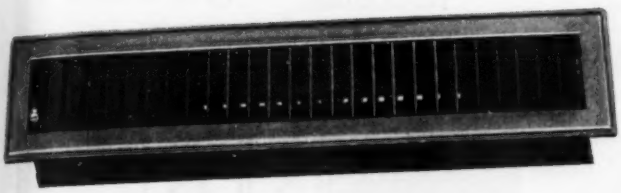
Preventive service work can be done on emergency service calls, on calls under contract or not under contract, or during an annual inspection of a customer's heating installation. His service men can make five or six inspections per day, he said.

There are some pitfalls, however, he warned. For example, customers too often blame the inspection for an equipment failure during the heating season. Too, customers may take free service as a "right." There is also the question of cost, though it is made up to some extent — as indicated — by sales of additional equipment and replacement parts.

*(More association news on page 47)*

# *The* INVINCIBLE TRIO *for* PERIMETER AIR CONDITIONING SYSTEMS

## THE NEW 410 U.S. DIFFUSER FLOOR REGISTER

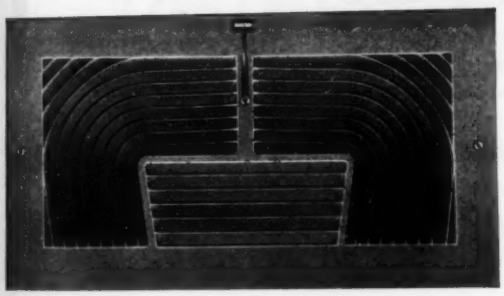


A new shade of Greytone finish matches the finishes of U. S. sidewall and base AC registers. Ask your jobber to show you the new No. 410 and to furnish you with the Genuine New 410 for 1955.

—with that NEW SECTOR-WHEEL Operator. POSITIVE—yet "FREE-WHEELING". Easily operated by Hand or Foot. The Set-Lock equipment simplifies System Balancing at the Register.

View showing New Sector Wheel construction—A unique U.S. Development that is brand new and wonderful.

## THE INCOMPARABLE NEW 105 U.S. SIDEWALL DIFFUZAIR



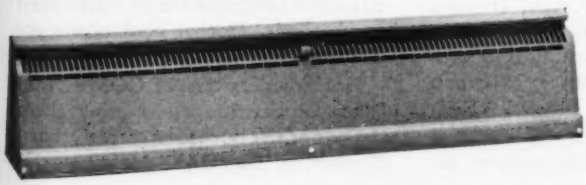
Out-performs all others! Perhaps Unbelievable—but TRUE! Completely blankets the entire walls and windows with the most Even "SUNBURST" Diffusion Pattern of all perimeter sidewall registers.

Gives you a full 180° diffusion with the Least Fan-Load and Least Resistance.

Its Companion—No. 106 U.S. BASE DIFFUZAIR—also out-performs any other type of perimeter base register. Complete with Head or without Head.

BOTH No. 105 and No. 106 HAVE ATTRACTIVE LOW LIST PRICES.

## NEW No. 1000 U.S. BASE DIFFUSER



No. 1000 is far exceeding its former record and going ahead in sales of all perimeter base diffusers known as "Strip Base". Nothing like its Sensational Success—nothing that compares with its labor-saving features and sales appeal. For warming and cooling perimeter systems. It adds the perfect finishing touch to that ultra-efficient and modern Air Conditioning System.

Remember the Adjustable Slide-Plate boot opening—saves cutting expense.

Remember the Setlock-Balancing Damper—saves one man's installing time.

Remember the New Design almost doubles face area—cuts resistance 60%.

**DON'T MISS THESE OUTSTANDING VALUES—GET THE BEST FOR LESS**
**NEW CATALOG No. 55-6 NOW READY — GET YOUR COPY**

**UNITED STATES REGISTER COMPANY**

**BATTLE CREEK, MICHIGAN**

**MINNEAPOLIS • KANSAS CITY • ALBANY**

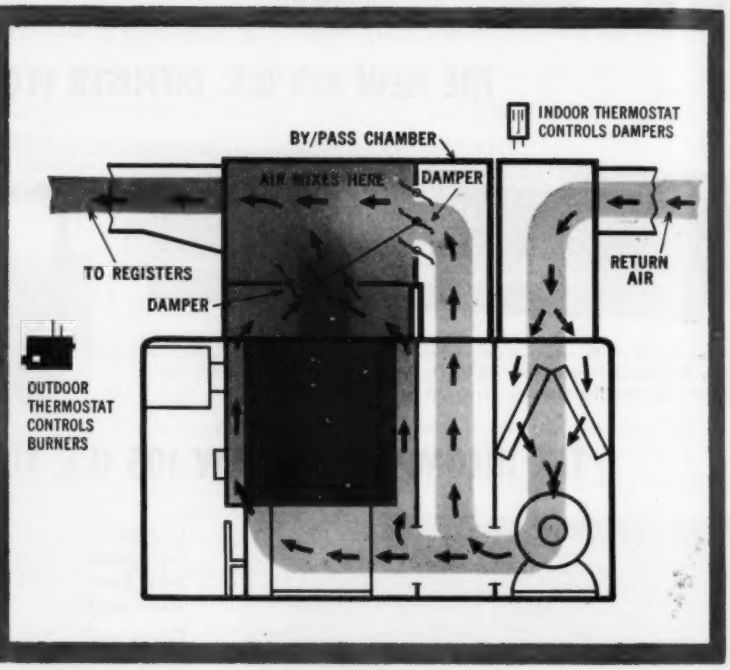
***HOME OWNERS WANT COMFORT!***

# OFFER THEM THE "CONSTANT COMFORT" OF Comfortrol BY PASS HEATING®

**NEW!**

**Waterbury Comfortrol BY PASS HEATING®**

**eliminates "hot-and-cold" feeling due to temperature variation!**



## *Provides constant flow of air at "just right" temperature*

You offer a homeowner the ultimate in comfort with new Waterbury Comfortrol BY/PASS Heating. Comfortrol maintains *constant-comfort* in the home no matter what kind of weather prevails outside. In cold weather tests, less than one degree variation in floor to ceiling temperature was recorded over an extended period of time.

With new Waterbury Comfortrol BY/PASS Heating, the system divides air returning from the rooms... heats part of that air . . . then mixes hot and cold together again in just the right proportions to give a *constant flow* of warm air. A continuous even temperature is maintained at all times. Hot or cold blasts are eliminated.

Homeowners WANT COMFORT! Beat competition by offering them the *constant comfort* of Waterbury Comfortrol BY/PASS Heating.

WORLD-FAMOUS

**Waterbury**

**FURNACES AND AIR CONDITIONERS**

THE Waterman-Waterbury Company

★

Minneapolis 13, Minn.

## *Heating and Air Conditioning Wholesalers Talk About*

# Solving Cooling Distribution Problems

**. . . at national spring meeting. Also discussed was an aggressive educational campaign designed for the dealer-contractor**

MEMBERS of the National Heating & Air Conditioning Wholesalers Association met at the Paradise Inn, Phoenix for their spring meeting, April 24 to 27. In his opening address, President William H. Bowe, Jr. defined some of the immediate aims and objectives of the association, one such objective being the development of an educational program designed to teach the wholesaler the most advanced techniques in heating and air conditioning, which he in turn could pass on to dealers and contractors and which would ultimately be reflected in increased comfort and greater convenience for the consumer.

In the general business session, Harold Squire of Squire Heating Supply Co., chairman of the air conditioning committee, discussed the interest being shown by wholesalers in air conditioning and the extent to which they are getting into this phase of the business. From his presentation of the results of a survey conducted among industry members, it was obvious that the wholesalers are preparing themselves for an increasingly important role in the distribution of year 'round air conditioning.

### Organize Information Program

William Fox, Heating Trades Supply, Inc., outlined a program to be carried out by the association on the interchange of technical and financial information. All members of the industry are requested to participate in this program. He also discussed a typical working plan for the handling and control of credits which is to be made available to the industry.

Bert Earnshaw of the Earnshaw Sheet Metal Supply Co., chairman of the educational committee, reported on the progress of dealers' schools and educational activities promoted by the association. It was agreed that the courses being given at Ohio State University for dealers be organized and published in manual form and made available to association members.

NEW EXECUTIVE DIRECTOR Wilbur R. Bull (left) relaxes between sessions with William H. Bowe, Jr., president, and Gaile Mason, president elect

### Trade Practice Rules Now in Force

Harold L. Slane, executive director and legal counsel for the Los Angeles wholesalers association, gave a report on the trade practice rules as they apply to the heating and plumbing industries which went into effect on May 15. At the banquet Monday night, Herb Askins, president of the National Association of Wholesalers, gave a talk, *The American Economy Is Cushioned by* 250,000 *Wholesalers.* He pointed out the fact that there is a very definite increase in

*(Continued on page* 50*)*

# DEMAND

# FAIL-SAFE PERFORMANCE!

- Reliable — Simple design
- Smaller, lighter, more compact
- Powerful solid FAIL-SAFE liquid fill
- Flexible capillary — various lengths

- Adjustable fan cutout
- Mounts, operates in any position
- For either line or low voltage circuits
- Available without case and cover
- Mounts flush

*You specify with Confidence . . .* *when you specify Perfex.*

## NEW

### PERFEX SERIES 480 REMOTE BULB, LIQUID FILL

## COMBINATION FAN & LIMIT CONTROL

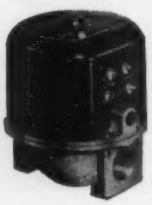
### WITH SINGLE ELEMENT

***Proven*** **FAIL-SAFE performance is assured with the Perfex Combination Fan and Limit Control, designed to meet the needs of any forced warm air system installation. Its single thermal element actuates both fan switch and limit switch. By every standard the Series 480 is the finest — you can *depend* on Perfex engineering and quality. Write for complete literature.**

480-C

**PERFEX CONTROLS DIVISION,** General Controls Co., Iron Mountain, Mich. & Guelph, Ont., Canada

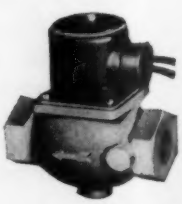
Factory Branches in all Principal Cities • Mfrs. of Automatic Controls for Heating, Air Conditioning and Appliances



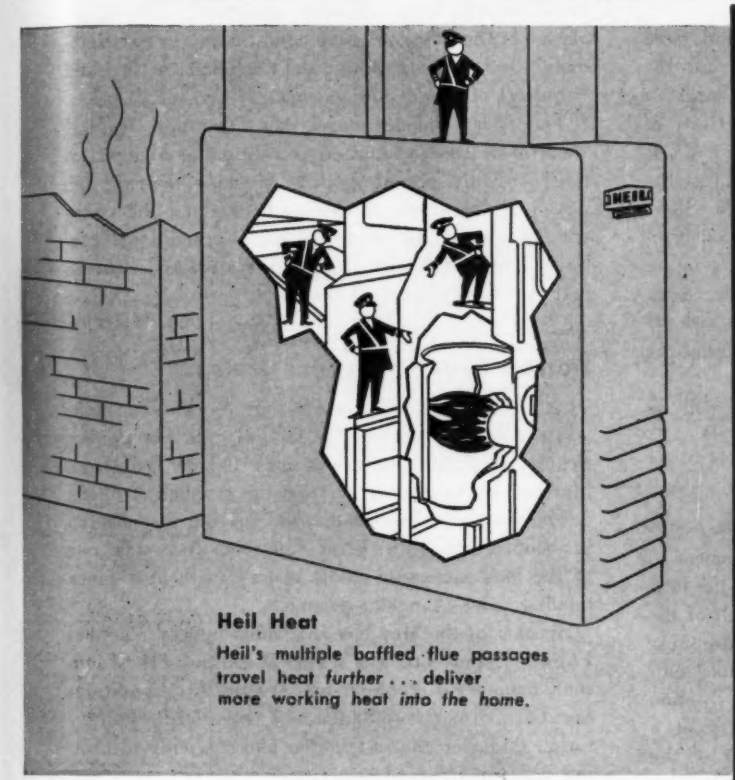
SERIES 3600
DIAPHRAGM
GAS VALVES

SERIES 175
MAGIC DIAL
THERMOSTAT

SERIES 3500
MAGNETIC
GAS VALVE

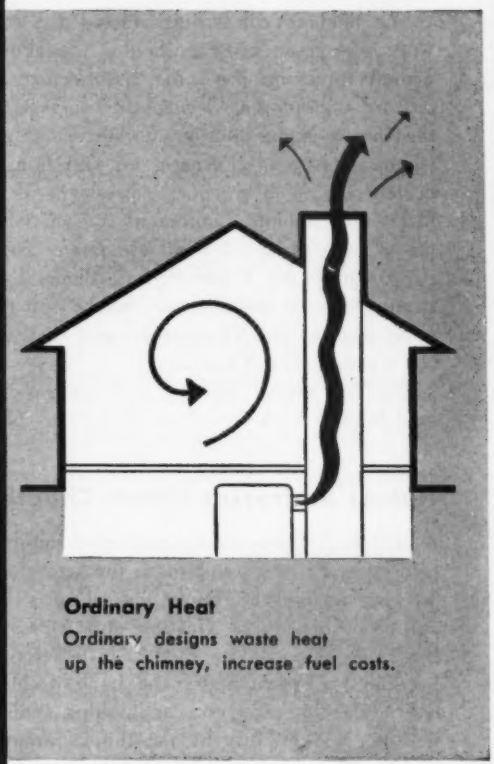


# What the Heck Is a Heil Heat Bank?



**Heil Heat**

Heil's multiple baffled flue passages travel heat *further* . . . deliver more working heat *into the home.*



**Ordinary Heat**

Ordinary designs waste heat up the chimney, increase fuel costs.

## . . . and why is it money in the bank for you?

A Heil "Heat Bank", very simply, is the exclusive tapered-top heat exchanger that pays the user dividends in extra *working* heat . . . pays *you* dividends in extra sales!

In addition, Heil offers you a complete line to fill *any* central heating or cooling need . . . *proved* more efficient operation . . . meticulous factory inspection, *assembly and wiring* . . . low guarantee-service history . . . and a famous name and reputation. *All* good reasons why you'll profit more with Heil!

**HEIL helps the wholesaler because the wholesaler helps you save money . . . in stock, inventory, buying and business expenses. Support your wholesaler, work with him . . . and profit!**

**The HEIL Co. is a member of OHI, GAMA and an associate member of NHWA.**

**THE HEIL CO.**

Milwaukee, Wisconsin — Hillside, New Jersey

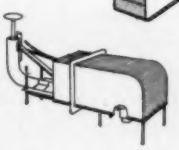
**SALES OFFICES: New York, N.Y.; Union, N.J.; Atlanta, Ga.; Cleveland, Ohio; Chicago, Ill.; Milwaukee, Wis.; Kansas City, Mo.; Denver, Colo.; Dallas, Texas; Los Angeles, Calif.; Seattle, Wash.**

13 Oil Furnace-Burner Units
Bonnet Capacities from
80,000 to 224,000 BTU

14 Gas Furnace-Burner Units
A.G.A. Input Ratings from
60,000 to 200,000 BTU

5 Conversion Oil Burners
Maximum Unit Output Ratings from
147,000 to 592,000 BTU

12 Summer Air Conditioners
Rated from
24,000 to 36,000



3 Conversion Gas Burners
A.G.A. Input Ratings from
70,000 to 400,000 BTU

*Write us direct for more information about the complete Heil line and for important news concerning territories available.*

the trend toward wholesaling. Willard T. Brooke, vice president of Peterson, Brooke, Steiner and Wist, gave a talk on *Sound Business Principles in a Changing World.*

The final day of business included a round table work session on air conditioning. Speaking for the manufacturers on *What the Manufacturer Needs in an Air Conditioning Wholesaler* were Art Horn of the Day & Night division, Carrier Corp. and W. J. Olsen, Armstrong Furnace Co. Speaking for the dealers was Walt Swenberg, president of the Sheet Metal and Roofing Contractors Association of Minnesota, who discussed *What the Dealer Needs in an Air Conditioning Wholesaler.* C. Blaine Lytle, Armstrong Furnace Supply, Inc., spoke for the wholesalers on *Why the Manufacturer and Dealer Need the Air Conditioning Wholesaler.*

The fall annual meeting and convention will be held in New York City November 27 to 29.

## Haines Addresses Illinois Chapter

A PERIOD of prosperity and continued improvement in comfort and living standards is predicted for the next 10 years by John E. Haines, national president of the American Society of Heating and Air-Conditioning Engineers. Mr. Haines discussed the economic outlook in the United States and its favorable reaction on the heating and air conditioning industry at a meeting held recently by the Illinois chapter of the society. He told the engineers that the sale of room air conditioning units should reach more than 2½ million units a year during the next 10 years and that more than a million residential central air conditioning systems a year should be installed by 1964.

He pointed out that by 1964 the gross national product is expected to reach a total of $500 billion, or 40 percent more than the estimated $360 billion spent in 1954. The sale of residential automatic heating units will rise to more than 2 million units yearly by 1964, Mr. Haines estimated, and the number of units in use will be over 30 million.

## Indiana Plans July Meeting

THE SHEET Metal and Warm Air Heating Association of Indiana reports in its *News Bulletin* that Merle Daily, Ben Flock and Woodruff Goodyear, committee on arrangements, are planning an outstanding meeting of Indiana heating, air conditioning and sheet metal contractors and their suppliers the evening of July 15, in the main ballroom of the Hotel Gary. The contractors' meeting in the evening is being sponsored by the Lake County Association in cooperation with the state association, whose board of directors will be in session at the hotel throughout the afternoon.

H. R. Smith Co., Miller Bros. Hardware and Richmond Supply Corp. recently sponsored night school classes at the offices of Richmond Supply Corp., Richmond, Ind. Subjects discussed included *Selling* and *Problems of Dealer Management.*

The *News Bulletin* notes that Operation WHAM (Warm air Heating and Air conditioning Modernization) recently passed its first birthday. During the past year, hundreds of dealers throughout the country have made use of the WHAM promotional material provided by the National Warm Air Heating and Air Conditioning Association.

## Detroit Group Sponsors Cruise

THE DETROIT Warm Air Heating Association plans a cruise from Detroit to Buffalo and return beginning Friday, July 8. Reservations may be obtained from Marshall H. VanAssche or from the association office.

The association reports that the meeting it sponsored in cooperation with Penn Controls, Inc. was one of the most successful in its history, with attendance totaling more than 800 persons.

Speaker at the May meeting, sponsored by National Furnace Supply Co., was Walter Woodroof. Mr. Woodroof, manager of cooling sales for the Air Conditioning Div., American Radiator & Standard Sanitary Corp., discussed the installation and servicing of cooling equipment.

## AGA Names New Managing Director

CHESTER S. STACKPOLE, general sales manager of the heating and cooling division, Union Asbestos & Rubber Co., has been appointed managing director of the American Gas Association. He succeeds H. Carl Wolf, who resigned early this year because of illness.

Mr. Stackpole has been active in AGA affairs for the past 25 years. He has served as vice president of the association and has also been chairman of the house heating committee and chairman of the residential gas section.

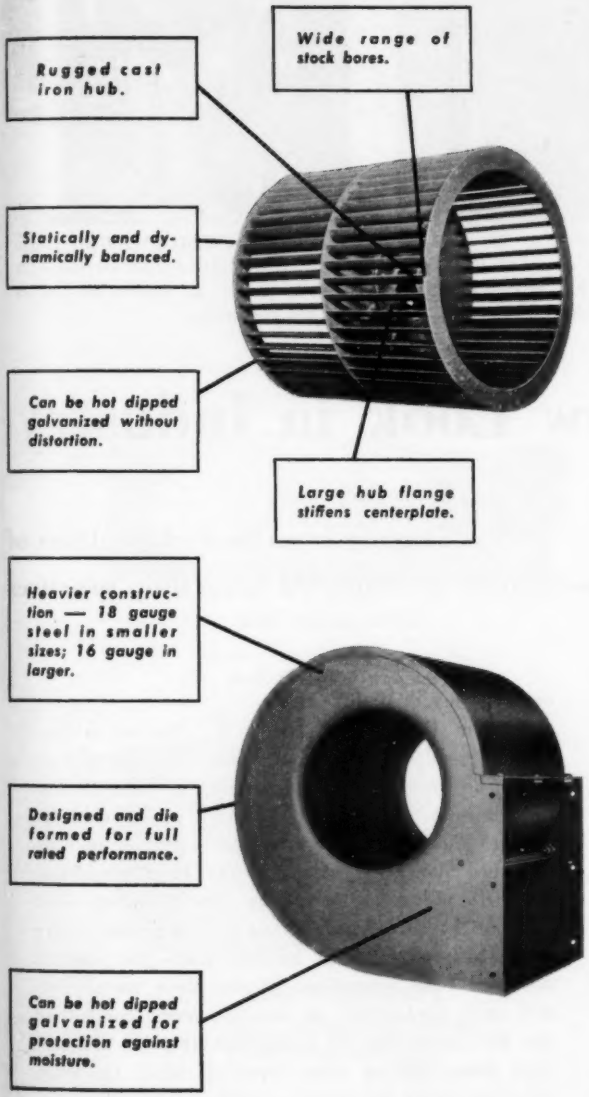
## ARI Appoints Publicity Director

TO HELP KEEP the industry informed on developments taking place in the air conditioning field, the Air-Conditioning and Refrigeration Institute has appointed A. Migliaro to serve as public information director. Mr. Migliaro was formerly on the editorial staff of the Washington Times-Herald and has also been associated with the Fairchild Publications.

(*More association news on page* 52)

**MEMO** for Air Conditioning Unit Manufacturers

# CLARAGE Type DF Fan Equipment is worth thousands of dollars to your sales department


Rugged cast iron hub.
Wide range of stock bores.
Statically and dynamically balanced.
Can be hot dipped galvanized without distortion.
Large hub flange stiffens centerplate.
Heavier construction — 18 gauge steel in smaller sizes; 16 gauge in larger.
Designed and die formed for full rated performance.
Can be hot dipped galvanized for protection against moisture.

You, too, will profit by using Clarage Type DF fan equipment. Here is equipment of KNOWN quality . . . it has proved its worth to numerous manufacturers of air conditioning units, evaporative condensers, cooling towers, circulators, etc.

Wheels, housings, or complete fans are available. Thorough engineering and heavier construction distinguish Clarage equipment. Results: full rated performance and trouble-free operation.

To obtain complete information, including dimensions and capacity ratings, use coupon below.

## COMPLETE FANS

**Type DF fans are built in 11 sizes with capacities ranging from 200 to 10,000 CFM. Special units for higher pressures and more severe services can be furnished.**

CLARAGE FAN COMPANY
619 Porter, Kalamazoo, Mich.

☐ Please send me your catalog on Type DF Fan equipment.

☐ Please have your nearest sales engineer contact us.

NAME_____

COMPANY_____

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You can Rely on...

# CLARAGE

Headquarters for Air Handling and Conditioning Equipment

SALES ENGINEERING OFFICES IN ALL PRINCIPAL CITIES • IN CANADA Canada Fans, Ltd., 4285 Richelieu St., Montreal

BETWEEN SESSIONS trade talk involves Grant F. Gillespie (center) and speakers William P. Loehrer (left) and Lee Wagener

CHALK IN HAND, C. W. Nessell illustrates a point on crawl space insulation during his report on Air Conditioned Village

RETIRING PRESIDENT Rudy Guenther (left) and reelected Secretary Jay Harms inspect air purifier on display at the convention

# Illinois Inspects New Look in Industry

## . . . ranging from the technicalities of air sterilization to improved basic shop practices

THE SHEET METAL contractor has better tools available for killing germs than many of the best equipped chemical laboratories, A. A. Jannings, Sampson Chemical & Pigment Corp., told members of the Sheet Metal Contractors Association of Illinois at the 41st annual convention held at the Pere Marquette hotel, Peoria, April 25-27.

Mr. Jannings described two phases of air purification — eliminating staleness, and killing of bacteria and odor — punctuating his remarks with demonstrations of various cathode tubes which are designed to accomplish the double purpose through ultraviolet radiation when installed in the return air duct of a furnace.

"Every new building that has a duct is a prospect for purified air," declared Mr. Jannings, "and warm air men — not electricians — are the logical ones to install the lamps." He added that it is vitally important that the person who installs the lamps have a thorough understanding of the characteristics and nature of moving air. He cited two advantages to dealers of promoting purified air: 1) periodic replacement of the lamps gives the dealer more contact with his customer; and 2) the customer will be anxious to show off the new "gadget" which protects the health of his family.

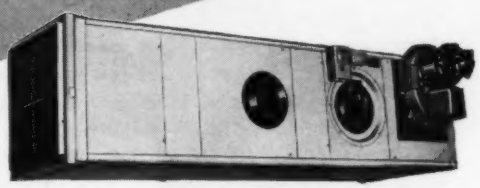
William P. Loehrer, Joseph T. Ryerson & Son, Inc., outlined *Opportunities for the Sheet Metal Contractor in Stainless Steel*, describing stainless steel as the "miracle of the 20th century." He traced the meteoric production rise from its beginning in common use about 1924 through the 1953 production of 1,015,303 tons — nearly 1000 percent over the 1936 figure of 101,882 tons and 84 percent above the 1946 production of 550,097 tons. Mr. Loehrer discussed basic operations of the sheet metal shop and their application on stainless steel, concluding that the operations are fundamentally little different from those used on other types of metal, the main difference being the usual realization of higher profits with stainless steel. He listed large industries such as meat, food processing, dairy, hospitals, laundry, brewing, petroleum, chemical, pulp and paper and automotive as major users of stainless steel, pointing out that the nature of these industries is such that the contractor is assured of steady, non-seasonal work.

Mr. Loehrer went into shaping and joining operations of stainless steel using standard equipment, describing certain methods and outlining precautions. He closed by reminding contractors that the day of

# YOU "outsell" WITH moncrief OIL AND GAS horizontal furnaces

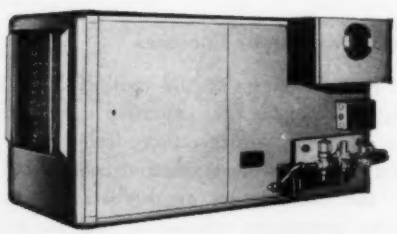
## BECAUSE THEY "excell" WITH...

- DESIGN
- CONSTRUCTION
- OPERATION
- INSTALLATION FEATURES



**OIL FIRED UNIT**

*4 Sizes... 84,000, 100,000, 123,000 and 224,000 Btu Output*



**GAS FIRED UNIT**

*4 Sizes... 65,000, 85,000, 100,000 and 140,000 Btu Input*

**NOW! From Moncrief's 60 years' experience in the manufacture of heating equipment comes a full line of Moncrief Horizontal Forced Air Heating Units, with a wider choice of sizes and capacities.**

**Four sizes of Moncrief *Oil* Fired Horizontals, and four sizes of Moncrief *Gas* Fired Horizontals, provide a heating capacity for practically every type of application in which the use of floor space is eliminated.**

**Suspended in an attic or in a "crawl space", Moncrief Horizontal Units are unexcelled for compactness, ease of installation, and trouble-free operation.**

***Yet, their price is competitively low, competitive even in today's highly competitive market!***

**Your opportunity to compete profitably with horizontal furnace installations is the full Moncrief line. See your Moncrief wholesaler.**

***They're Built Right!***
***They're Priced Right!***

**THE HENRY FURNACE COMPANY • Medina, Ohio**

HEATING AND AIR CONDITIONING UNITS — MONCRIEF — FURNACE PIPE AND FITTINGS

trial and error in the shop is over and urging them to call on producers for help in solving shop problems.

### Examine Costs, Credit Structures

The need for more efficiency from labor was emphasized by J. A. Livi, Surface Combustion Co., in his address on credit control. Increased competition and material costs, he said, have cut into everybody's profits; contractors must do a better job with less labor and waste. Backbone of any cost trimming program is a good standing credit system which can shift into operation quickly. Such a system is a valuable asset and is well worth the cost of having a professional accountant go over the books and set up a more efficient system, Mr. Livi stated. He added that efficient operation demanded an inventory turnover at least every 90 days.

As a criteria for comparison of profit and loss standings, Mr. Livi presented a composite analysis of profit and loss statements of 1300 companies operating both as individuals or partnerships and as corporations. Based on total dollar volume of sales and broken down by material and labor costs and sales and administrative expenses, the analysis was presented on mimeographed handouts as a reference for members to use in establishing a more profitable operation.

### Wall Panels, Roof Deck Are Rising Factors

"The new look is low and long and out in the suburbs," said Victor Pignolet, Inland Steel Products Co., in discussing *The Growing Field in Steel Roof Deck on Metal Buildings.* Mr. Pignolet advised contractors to direct more effort toward getting their share of the $5 to $7 million in steel roof deck which will be sold in Illinois this year.

Lee Wagener, Peoria contractor, spoke on *Promotion of the Sale of Rain Carrying Equipment, the Bread and Butter of the Sheet Metal Contractor,* contradicting those contractors who do not work with gutters and downspouts on the theory that they are unprofitable. Mr. Wagener stressed the use of labor saving devices and suggested a better job of planning which eliminates minutes and hours to bring down the costs.

*Problems in Air Distribution on Present Day Heating and Cooling Jobs* were aired by Leonard Kroes, Brundage Co., who said constant changes in industry are placing more and more load on the blower. Heading the list of causes of blower failures, he said, is over-tight belts; another trouble maker is the popular detergent type oil when used on blowers which have formerly been lubricated by conventional oils. Mr. Kroes cited the growing popularity of direct drive blowers and factory packed bearings.

C. W. Nessell, in his discussion, *Some of the Things We Have Learned About Residential Heating and Cooling* brought out the problems and solutions uncovered to date as the result of the Austin, Tex. Air Conditioned Village experiment. (The entire preliminary report by Mr. Nessell has been published in previous issues of American Artisan.)

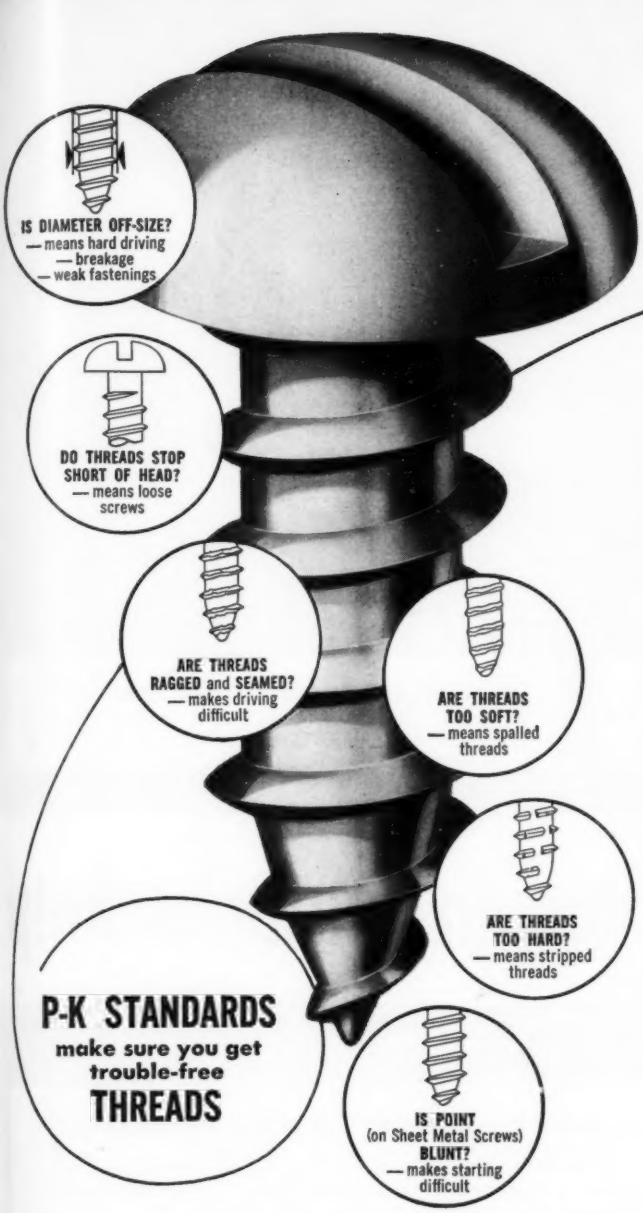
### New Equipment Demonstrated

A session devoted to discussions of modern equipment for sheet metal fabrication included the following speakers and their topics: Harry Johnson, RCS Tool Sales Corp., stressed the use of labor saving tools in reducing labor costs; T. A. Johansen, Central West Machinery Co., urged contractors to take advantage of the valuable assistance available from manufacturers of sheet metal tools and equipment; Richard Johnson, Dreis & Krump Mfg. Co., predicted that many manufacturers would go into mass production of press brakes, which are just now coming into their own as modern, versatile pieces of equipment; Harold McCormick, Gibson Industries, Inc., demonstrated the use of an electric hand tool for turning the flange on a Pittsburgh lock; T. W. Mather, Huck Mfg. Co., explained the use of various fasteners, including a bolt which is a cross between a rivet and a locking bolt, pull-through and self plugging rivets, and a stud fastener for duct insulation.

### Continuing Boom Foreseen

In his talk on residential cooling, W. H. Calahan, Williamson Heater Co., identified the heating dealer, rather than the refrigeration dealer, as the logical person to handle the residential cooling business. He cited the combination of decreasing costs and increasing popularity of central air conditioning in residences as a healthy indication of a continuing boom. Mr. Calahan also outlined the advantages of air cooled condensing units for residential cooling.

A. H. Schroeder, Champaign, was elected president of the association to succeed Rudy Guenther, Chicago. Other officers elected are: E. A. Schmidt, vice president, Springfield; Jay E. Harms, secretary and Frank Eynatten, treasurer, both of Peoria and both reelected. New directors are Tom Novak, Chicago (3 years); Carl R. Berry, Bloomington (3 years); Sherman Schively, Hoopstown (2 years); Rudy Guenther, Chicago (1 year); Frank Mehrings, Peoria (1 year). Directors held over are W. R. Shaw, Jacksonville; George Sturm, Macomb; Edward A. Godlewski, Rockford; George Bushman, Aurora.




**P-K STANDARDS PROTECT** you against these and many other symptoms of screws that are "trouble-bent." They don't "get by" P-K inspectors — that's why *all* P-K Sheet Metal Screws can be "Guaranteed First Quality."

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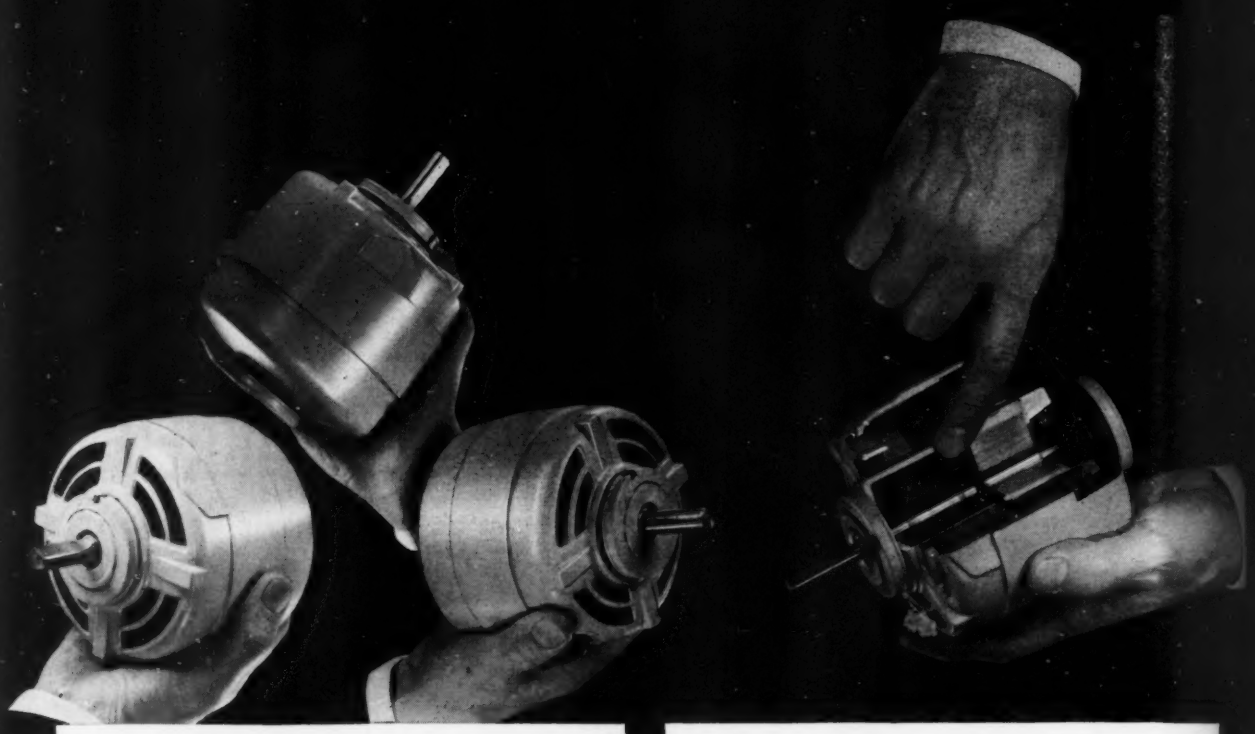
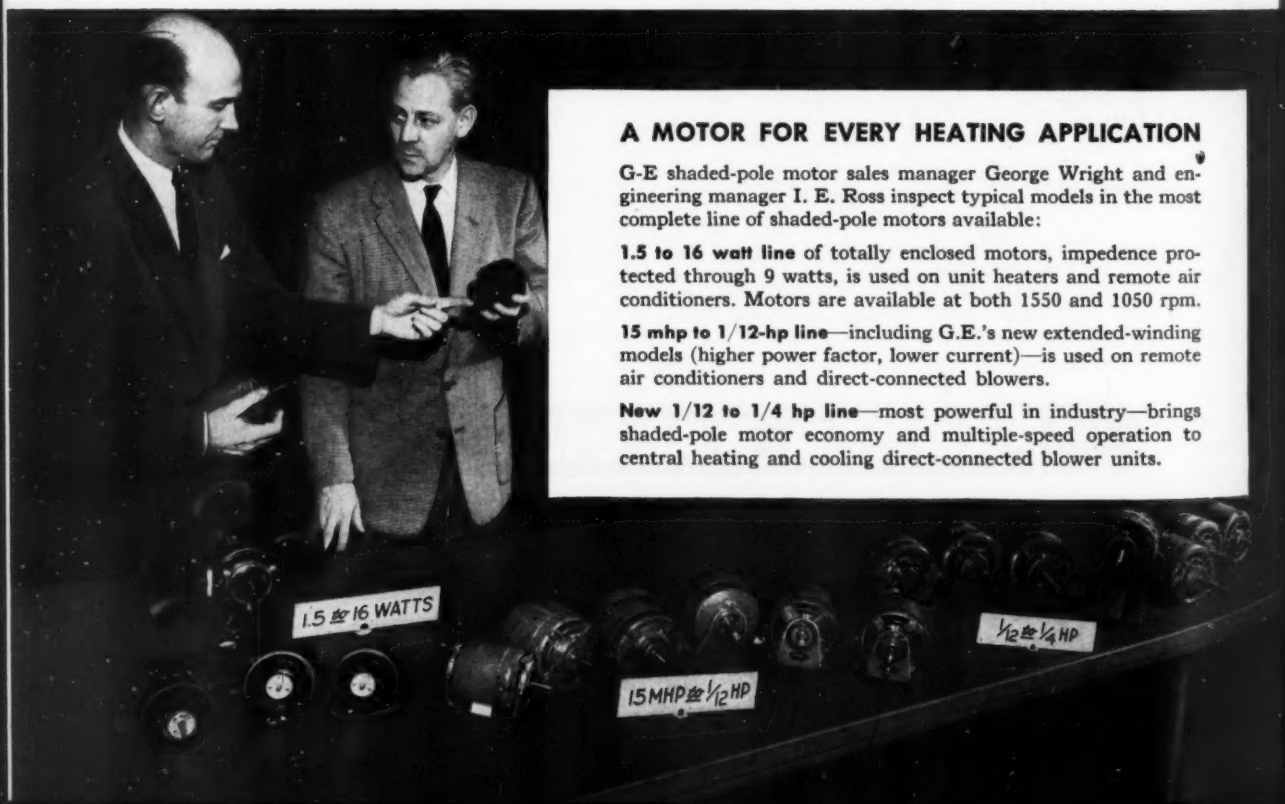


**1 ALL-ANGLE OPERATION** provided by sealed-in lubrication and advanced bearing designs permits mounting G-E shaded-pole motors shaft up, down, at any angle.

**2 SEALED-IN LUBRICATION** minimizes motor maintenance and contributes to long motor life by protecting bearings from foreign materials and improper oiling.

# These advanced design features help




## A MOTOR FOR EVERY HEATING APPLICATION

G-E shaded-pole motor sales manager George Wright and engineering manager I. E. Ross inspect typical models in the most complete line of shaded-pole motors available:

**1.5 to 16 watt line** of totally enclosed motors, impedence protected through 9 watts, is used on unit heaters and remote air conditioners. Motors are available at both 1550 and 1050 rpm.

**15 mhp to 1/12-hp line**—including G.E.'s new extended-winding models (higher power factor, lower current)—is used on remote air conditioners and direct-connected blowers.

**New 1/12 to 1/4 hp line**—most powerful in industry—brings shaded-pole motor economy and multiple-speed operation to central heating and cooling direct-connected blower units.

**3 UNIT BEARING** for smaller motors provides larger bearing area, positive rotor alignment. **TWO-BEARING DESIGN** in larger motors has same forced oil re-circulation.

**4 THREE-WAY MOUNTING** is offered on most G-E shaded-pole motors: cushion end-rings, through-bolts, resilient cradle bases. Extra-high bases are also available.

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You see above some of the outstanding features of General Electric shaded-pole fan motors which help assure maximum product life of your heating equipment. Now, check these other reasons why leading heating-equipment manufacturers make G-E shaded-pole motors the low-cost answer to more compact, more saleable products:

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**LONG-LIFE BEARINGS**—G-E shaded-pole motors bring you the benefits of sealed-in lubrication. Oil grooves in shaft provide positive lubrication of filtered oil to bearing surfaces.

**COOLER OPERATION**—Improved ventilation of G-E shaded-pole motors results in longer life through cooler bearings and windings. Higher efficiency (lower heat loss) of 1/12- to 1/4-hp line simplifies provision for motor ventilation in your products.

**EXPERT APPLICATION HELP** from G-E engineers is available to you. For **complete** shaded-pole motor service, contact your local G-E Apparatus Sales Office early in your planning when G-E engineers can help most. And write for bulletin GEA-6134 to Sect. 704-51, General Electric Co., Schenectady, N. Y.

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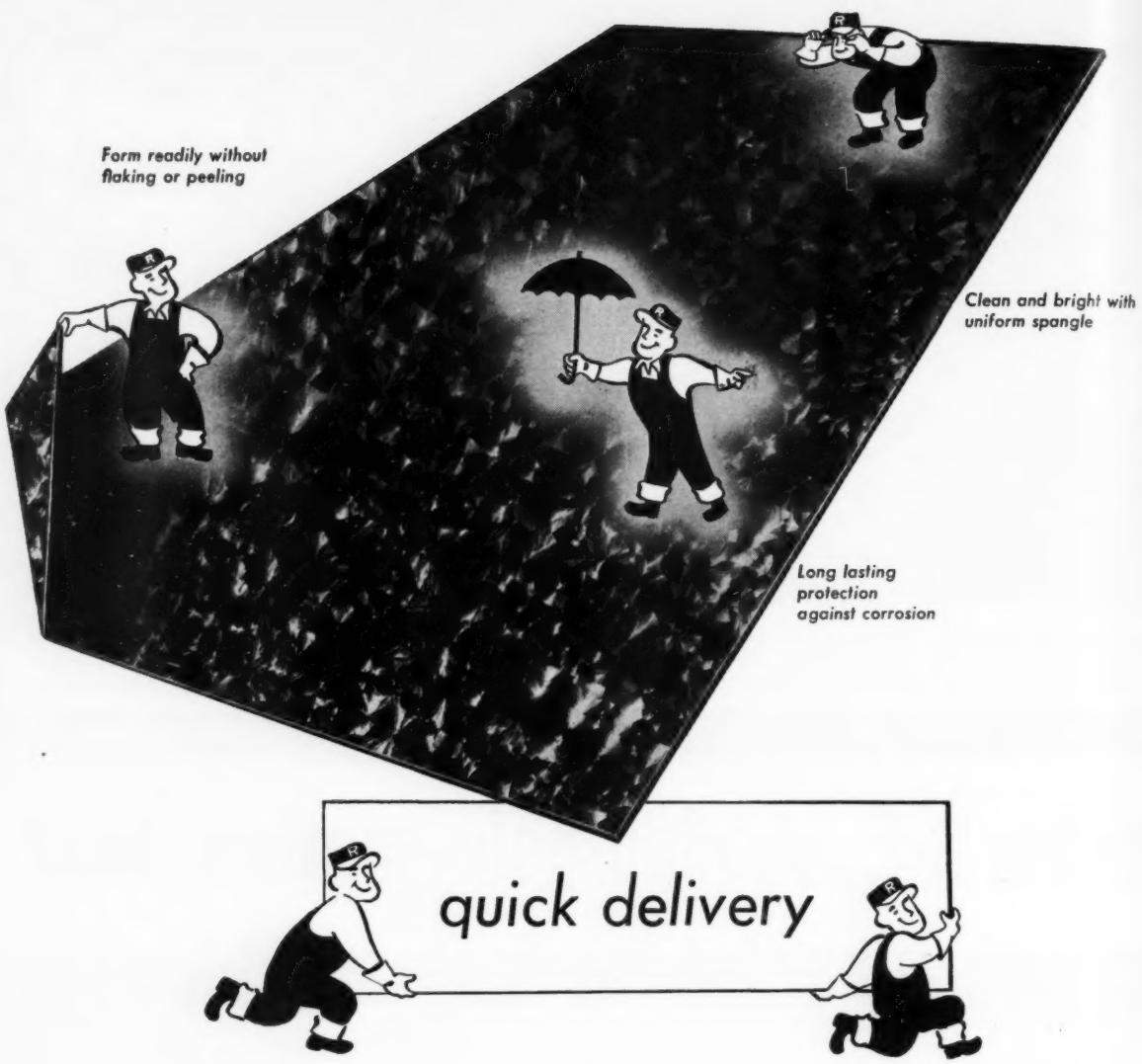
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editorial

# "Industry Audit" of Warm Air Heating — Who Dreamed It Up?

EVERY INDUSTRY — especially if it is a growing and vital one — has problems. And the problems of different industries are pretty much the same, we suspect, in their broad and general aspects.

An objective, "outside" appraisal of an industry can thus be of value. But the usefulness of such an appraisal is impaired if the information on which is is based and the conclusions it draws are not thoroughly checked.

The "American Institute of Management" has issued an "audit" of the warm air heating industry. Copies have been mailed to many in the heating business, with an "invitation" to join the Institute.

We have no quarrel with many of the statements in this "audit." For example, it is pointed out that central heating, cooling and air conditioning equipment will gain widespread consumer acceptance in the next 10 years. It is stated that the great majority of homes in the U. S. are heated by warm air, that this trend has been increasing, and that warm air furnaces are pre-eminent in residential heating. It is stressed that research is responsible in large part for the commanding position that warm air heating holds in the residential field. It is suggested that "the most notable manufacturer abuse is the sale of furnaces direct to builders," bypassing regular channels of distribution. It is stated that furnace manufacturers have a commendable record of production efficiency; that labor-management relationships in most companies, though informal, are excellent; and that competition within the industry has always been high.

We accept these statements from the "audit" as accurate. But much of the content of this report, and its general critical attitude toward the warm air heating industry, seem to be highly questionable if not downright incorrect.

We think the inaccuracies probably stem from two causes: (1) Many of the statements, applied in this "audit" to warm air heating, are of such a general nature that they could be applied equally as well to any industry. (2) We don't think enough sources were consulted on which to base observations intended to apply to the entire warm air heating industry.

Too, we feel that the report is confusing in that it speaks highly of the industry in many ways — but the overall effect gives a very negative impression of the job the industry is doing. Its reasoning doesn't seem to follow its own statements.

Let's look at a few of the "general" statements. After crediting the industry for its research and development, the report says, however, that modern warm air heating depended on "almost complete electrification of the home." So what? What industry doesn't depend on progress in other industries? "Heating and cooling units can be improved in both price and efficiency," says the report. Couldn't that be said about any product ever manufactured? The warm air heating industry "must still contend with widespread public ignorance," it says on another page. You could say that about almost anything, it seems to us. But is it true of the warm air heating industry, when public acceptance is as great as the report itself indicates?

The AIM is "particularly disturbed," it notes, "by the complacent reliance of some industry leaders upon the future introduction of atomic fuels to stimulate the industry's growth" and says that this "dependence on the future in place of vigorous current research cannot be condoned." Who are these industry leaders that are sitting quietly in a corner doing nothing but awaiting atomic heating in the home? What industries have better records of university research, manufacturer research and development, cooperative projects, the National Warm Air Heating and Air Conditioning Association's "mobile laboratory," etc.?

A couple of furnace manufacturers will be surprised, we think, to note in the report that their names "have completely disappeared."

Other inaccuracies could be cited — but enough of this. What we object to mainly in this "audit" are such statements as "the industry will have to furnish protection to the consumer if it is to avoid floundering in a morass of public suspicion and discontent," that "unethical practices are widespread," that furnaces "which should have been replaced have often been repaired at the peril of the health and safety of the consumer," and the report's statement that "the greatest potential for success" in the direction of manufacturers "policing installations" of their equipment "lies within manufacturer-distributor companies, since the machinery for strict accountability is already present there." The Institute says it regrets the necessity of any external regulation but that "public concern and the absence of an acceptable alternative make such regulation the most probable solution to the industry's serious public relations problem."

Who dreamed all this up? Maybe a case or two could be cited to support such statements — or any statement anyone wanted to make about any industry. But as general observations in what is purported to be an "audit" of the entire warm air heating industry, they give a highly inaccurate impression of the industry's operations and its public relations.

# How to Design

# Year 'Round Air Conditioning Distribution Systems

**By Clarence L. Grandstaff**
**Chief Applications Engineer**
**C. A. Olsen Mfg. Co.**

**A flexible method of design using cfm for selecting heating and cooling equipment provides well balanced distribution for a graduated trunk duct installation as well as an extended plenum system through which the sample plan is developed**

THE ADVENT of year 'round air conditioning of the homes we live in has presented some problems with which the one season system did not have to cope. Nor were these problems present when the heating and cooling air was handled through different distribution systems.

Manuals 3 and 11 of the National Warm Air Heating and Air Conditioning Association cover quite adequately the methods of determining the rates of heat loss and heat gain. Manual 11 also contains a method of duct sizing to be used in conjunction with Manual 7.

Manual 7 was developed to use air volumes that are obtained when the temperature rise through the system is 100 deg, or in other words when the temperature of the air leaving the furnace bonnet is 165 F. This manual also provides for the use of 0.20 in. external pressure on the distribution system with 0.10 in. being exerted on the supply side and 0.10 in on the return side.

Manual 11 tables use air quantities of 300, 360, or 420 cfm per ton of cooling; other tables show Btuh delivered for these three ranges of operation. This manual also uses 0.10 in. static pressure on each side of the distribution system. In addition, it contains correction factors to be applied for other pressures.

## Flexible Design Method Needed

Because of the fixed nature of Manuals 7 and 11 it has been found that a more flexible method of design is desirable. Such a method can be obtained through the use of the cfm method; it is the purpose of this outline to present a method which, when followed, will provide a distribution system that will be as well balanced for both heating and cooling as it is possible to have such systems. The method is one which we feel answers many of the needs for such a system and reflects only the procedures we are now using.

Examples given in these articles will apply to a rectangular ($26\frac{1}{2} \times 41\frac{1}{2}$ ft) house with basement and a carport on the north side. The kitchen, measuring about $8 \times 12$ ft, has eastern exposure as do the $8\frac{1}{2} \times 11\frac{1}{2}$ ft dining area, $7 \times 7\frac{1}{2}$ ft bath and bedroom no. 2 which is about $11 \times 11$ ft and also has a southern exposure. Bedroom no. 1, $9 \times 13$ ft, has windows on the south and west sides. A den measuring about $9\frac{1}{2} \times 10$ ft has one window on the west side. The $13 \times 18$ ft living room has a large picture window also facing west. Each room contains one floor diffuser with the exception of the living room which has two floor diffusers against the outside wall and a low wall register located in the partition facing the outside wall. The living room and dining area windows are hermetically sealed double glass; all others are casement except the bedroom windows on the south side which are non-opening single pane glass.

It is our belief that precalculated Btu methods are good when the design conditions fall within their limitations. However, we believe the cfm method is not limited by fixed bonnet temperature nor by fixed static pressures except those that mark the limitations of the equipment to be used.

We find that the cfm requirement represents the best common denominator betwen the calculated Btu re-

quired for heating and that required for cooling. Therefore, the cfm method should be the easiest to use when understood.

When designing a winter air conditioning system the air volume required for each room (cfm) is predicated upon the actual heat loss calculated. This however, is not the case when using a factory sized cooling unit, such as is commonly installed in residences. The cooling unit capacity is based on the circulation of a given quantity of air over the coil and most equipment is rated for 400 cfm per ton. Therefore, to obtain full rating, the cooling system should be designed to deliver the cfm per ton used for rating.

Manual 11 establishes 300 cfm per ton as the air volume to be used for the humid areas, 360 cfm per ton for the medium areas and 420 cfm per ton for the dry areas; this approximate volume of air must be circulated and be equally distributed to each room in direct ratio to the calculated room cooling requirement.

### No Heating-Cooling Ratio

Because of this requirement there does not exist any fixed ratio between cooling Btu and heating Btu that can be used for the design of a balanced system. Therefore, the following procedure is based upon the cfm required and outlines what we feel are the necessary steps to complete the design of a balanced year 'round system.

### Methods for Calculating Loads

Following is a step by step design for a year 'round air conditioning system, using the cfm method and Manual 9 of the National Warm Air Heating and Air Conditioning Association:

Calculate the heating load using form 9A of NWAHACA and Manual 3. Determine the heat loss of any basement room to be heated for occupancy as outlined in Manual 3. For heating of basement rooms not used for living quarters or recreation areas, calculate the heat requirements for only that part of basement that is above grade. Determine the requirements of both excavated and unexcavated space, using Manual 4 for those factors that do not appear in Manual 3. Such spaces must be heated to provide winter comfort.

Select the unit from the total for all spaces using the *bonnet rating* of the equipment.

Calculate the cooling load as outlined in the Cooling Manual 11, of NWAHACA. Note that basement loads are not included unless those rooms are used as living rooms and have full wall exposures and large window areas.

Select the cooling unit that will provide the required Btuh as calculated. Remember that better comfort results are obtained from a unit that is slightly undersized rather than oversized.

### Examine Construction Details

If the cooling requirements fall slightly beyond the capacity of a unit, examine the construction details and, if possible, make recommendations for changes that will reduce the load. Quite often it is possible to add shading devices, attic ventilating fans or extra insulation at a lower cost than would be represented by a larger cooling unit and its equally larger distribution system. Then too, the reduced operating costs should also be considered.

If the load cannot be reduced to within 15 percent of desired unit capacity use the next larger piece of equipment or, in the case of a large job, use two smaller systems and zone the structure. Two 2 hp units would be far better than one 5 hp installation where the load is beyond the allowable limits for a 3 hp system.

### Use Worksheet for Calculations

Refer to work sheet 9HC and enter on line 2 the room names. Work sheet 9HC is reproduced through column 3 on page 62. The original sheet contains 12 columns covering duct runs to each room. Allow, for estimating purposes, one outlet for each 8000 Btuh heat loss. This is the Btuh shown for each room on line 14 of work sheet 9A.

Using the cooling load figures from line 16, form 11 for cooling, allow 4000 Btuh per outlet for determining the number of outlets for each room.

Enter on line 4 of form 9HC the Mbh (1000 Btu/hr). Enter both heating and cooling loads in their respective columns.

Enter on line 5, form 9HC, the Mbh for each supply outlet.

Select locations for supply outlets and indicate on floor plans. Perimeter locations are preferred by this writer for both heating and cooling with floor diffusers being first choice over other types of diffusers.

If the cooling requirements indicate that extra runs are needed over the requirements of the heating system, place the heating diffusers where they will serve the heating requirements to best advantage. Place the extra outlets for cooling at the perimeter also, if possible, or select a high wall location which will permit discharging the cooled air into the room at some point where it will best be distributed over areas that might not be covered by the perimeter diffusers.

Be cautious in the selection and use of perimeter wall diffusers and

THE METHOD described here for the design of year 'round air conditioning distribution systems is now being used by the author's company and its adaptation is being considered for use by the National Warm Air Heating and Air Conditioning Association. NWAHACA Manuals 3, 4, 7, 9, and 11 will be required for reference in working out the problems contained in this article and a subsequent article which will deal with the return air system and trunk line sizing. Also required will be NWAHACA form 9A to calculate the heat loss and form 11 for calculating heat gain, as referred to in this discussion. Form 9HC has been developed by the author for use with NWAHACA Manual 9 in calculating both heating and cooling requirements.

Form 9HC March 3, 1955

## WORK SHEET FOR HEATING & COOLING

### SUPPLY — BRANCH, STACK, and REGISTER SIZING

| LINE | ITEM | REFERENCE | 1 | | 2 | | 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Outlet No. | From Plan | 1 | | 2 | | 3 | | |
| 2 | Room Use | From Work Sheet 9A and 11 | Living | | Living | | Living | | Di |
| 3 | Run Use | | HEAT | COOL | HEAT | COOL | HEAT | COOL | HEAT |
| 4 | 1000—BTU per Hr. Room Total | Line 14 on Work Sheet 9A Line 16 on Work Sheet 11 | 12.0 | 9.3 | | | | | 3. |
| 5 | 1000—BTU per Hr. Per Outlet | Line 4 divided by No. of Outlets | 6.0 | 3.1 | 6.0 | 3.1 | — | 3.1 | 3.0 |
| 6 | Actual Duct Length in Ft. Horizontal and Vertical | Measure from Plan | 6' | | 13' | | — | 14' | 25' |
| 7 | Design Bonnet Temp. for Heating | Table A and Line 6 Use 130° | 130 | | 130 | | — | | |
| 8 | CFM per 1000—BTU | Heating Table A and Lines 6 and 7 Cooling Table Ac and Line 6 | 16.4 | 30 | 16.4 | 31 | — | 31 | 1 |
| 9 | CFM for Each Outlet | Lines 5 Times Line 8 | 98 | 93 | 98 | 96 | — | 96 | 5 |
| 10 | Bonnet Pressure | Select from Main Tr. having Max. Bonnet Press. Line 11* | .15 | .15 | | | | | |
| 11 | Equiv. Length (Fittings Only) | Fig. 1 and Lines 23 and 24 | 75' | | 70' | | 100' | | |
| 12 | Total Equiv. Length | Line 6 Plus Line 11 | 81' | | 83' | | 114' | | |
| 13 | †Register Deflection in Degrees | Determine from Plan | | | | | | | |
| 14 | †Throw from Register in Ft. | Measure from Plan | | | | | | | |
| 15 | †Register Free Area | See Manufacturers Data | | | | | | | |
| 16 | Register Pressure Loss | See Manufacturers Data | .03 | | .03 | | | .02 | |
| 17 | Actual Duct Loss (Total) | Line 10 Minus Line 16 | .12 | | .12 | | | .13 | |
| 18 | Loss per 100 ft. | Table D and Lines 12 and 17 | .15 | | .15 | | | .12 | |
| 19 | Duct Size (Round) | Table E and Line 9 and 18 | 6" | | 6" | | | 6" | |
| 20 | Stack Size | Table F and Line 19 | | | | | | 3¼x10 | |
| 21 | Register Size | Table G and Line 15 and 20 | 2¼x14 | | 2¼x14 | | | 10x6 | |
| 22 | Register Location | | Floor | | Floor | | | High | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 23 | Total CFM any ONE MAIN Trunk | 800 to 1000 | 1000 to 1200 | 1200 to 1800 | 1800 to 2400 | 2400 to 3500 | 3500 to 5000 | 5000 to 7500 | 7500 to 10000 | 10000 to 12000 | 12000 to 14000 | TRUNK LINE I |
| 24 | Suggested Bonnet Press. | .10 | .10 | .10 | .13 | .14 | .15 | .25 | .375 | .50 | .75 | TRUNK LINE II |
| 25 | Approx. Equiv. Length per Elbow (Trunk Line Class 2B) | 15 | 20 | 25 | 30 | 35 | 40 | 40 | 40 | 50 | 50 | Equivalent leng |

*If this maximum value of bonnet pressure (see line 11 under "reference") is not high enough to take care of maximum loss on lines 16 and 17 or results in the use of too large main trunk lines on big jobs, then use higher bonnet pressure

†Used only for high wall and ceiling outlets

baseboard sections for cooling. Although these devices are unexcelled for heating, their location must be selected with care for cooling.

Properly sized with the correct throw and spread they will serve satisfactorily when the drapes are not drawn; however, when confined behind close fitting drapes, throw and spread are impaired and, although the required air volume may enter the space, it may not properly diffuse and could produce a condition of low temperature air stratification on the floor and undesirable temperatures at the upper and intermediate levels.

After locating the outlets on the plan, measure the actual distance between the unit plenum and each outlet, and enter the measurements in feet on line 6 of form 9HC.

**TABLE Ac—CFM FACTORS for use with total heat gain as calculated from Manual 11**

| *Duct Length | Low | Medium | High |
|---|---|---|---|
| 0 | 25 | 30 | 35 |
| 5 | 25 | 30 | 36 |
| 10 | 26 | 31 | 36 |
| 15 | 26 | 31 | 37 |
| 20 | 26 | 32 | 37 |
| 25 | 27 | 32 | 38 |
| 30 | 27 | 33 | 39 |
| 35 | 27 | 33 | 40 |
| 40 | 28 | 34 | 40 |
| 45 | 28 | 34 | 41 |
| 50 | 28 | 35 | 42 |
| 55 | 29 | 36 | 43 |
| 60 | 29 | 36 | 44 |
| 65 | 30 | 37 | 44 |
| 70 | 30 | 37 | 45 |
| 75 | 30 | 38 | 46 |
| 80 | 31 | 39 | 47 |
| 85 | 31 | 39 | 48 |
| 90 | 32 | 40 | 50 |
| 95 | 32 | 41 | 51 |
| 100 | 33 | 42 | 52 |

Note: figures are based on 300 cfm per ton as low; 360 cfm per ton as medium; 420 cfm per ton as high.
*Bonnet to register

Design bonnet temperature is not determined for cooling but will be established later for heating.

Next, refer to the sheet headed *Cfm Factors for Total Heat Gain*, Table Ac, and enter on line 8 (work sheet 9HC) the proper factor as related to the zone location of the building and the actual duct length.

For example, If you have used the medium zone factor in Manual 11 for the cooling load calculation and the outlet is 40 ft from the unit, the factor 34 will be used. This is 34 cfm for each thousand Btuh heat gain.

Multiply the cooling value on line 5 (thousand Btuh) by cfm per 1000 Btuh, line 8, and enter the required outlet cfm for cooling on line 9. (No heating calculations are made yet.)

It is necessary to know the bonnet temperature that the cooling cfm would produce during the heating cycle. The bonnet temperature is required in order to design into the distribution system a balance that will allow satisfactory operation from either the heating or the cooling system. To determine what conditions the cooling cfm would impose on the heating system, it will be necessary to refer to the chart headed *Bonnet Temperature Selection Chart*. On this chart first locate at the top right the measured duct length (line 6, form 9HC) nearest to that of the outlet being checked. Read down this column until the figure nearest the cooling cfm is noted. Then cross to the left to the figure that most nearly represents the heat loss to be supplied by the outlet. Now proceed upward to the design bonnet temperature at the top of the column.

*Example*: Bedroom 1 of the house described previously requires a duct run of 37 ft and 142 cfm for cooling. The question is, what bonnet temperature will be required for the heat loss of 7900 Btu? In the 40 ft column (nearest 37 ft) locate 144 cfm (nearest 142) and cross to the left where 7.9 is found. Following the column upward it will be noted that 130 F bonnet temperature would be required by this one outlet.

This procedure should be repeated for each outlet and the *indicated* bonnet temperature listed for each outlet on line 8 of work sheet 9HC.

## BONNET TEMPERATURE SELECTION CHART

| Heating | | | | | | | | Cooling | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Design Bonnet Temperature and Heating Btu | | | | | | | | Duct Length and Required Cooling cfm | | | | | | | | |
| Temperature (deg F) | | | | | | | | Length (ft) | | | | | | | | |
| 110 | 120 | 130 | 140 | 150 | 160 | 170 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
| .9 | 1.1 | 1.2 | 1.4 | 1.6 | 1.7 | 1.9 | 20 | 21 | 21 | 22 | 23 | 24 | 25 | 25 | 26 | 27 |
| 1.1 | 1.3 | 1.5 | 1.7 | 1.9 | 2.1 | 2.3 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 31 | 33 | 34 |
| 1.3 | 1.6 | 1.8 | 2.1 | 2.3 | 2.5 | 2.7 | 30 | 31 | 32 | 33 | 35 | 36 | 37 | 38 | 39 | 40 |
| 1.5 | 1.8 | 2.1 | 2.4 | 2.7 | 3.0 | 3.2 | 35 | 36 | 38 | 39 | 41 | 41 | 43 | 44 | 46 | 47 |
| 1.7 | 2.1 | 2.4 | 2.7 | 3.1 | 3.4 | 3.7 | 40 | 41 | 43 | 44 | 46 | 47 | 49 | 50 | 52 | 54 |
| 1.9 | 2.4 | 2.7 | 3.1 | 3.5 | 3.8 | 4.2 | 45 | 46 | 48 | 50 | 52 | 53 | 55 | 57 | 59 | 60 |
| 2.2 | 2.6 | 3.0 | 3.4 | 3.9 | 4.2 | 4.6 | 50 | 52 | 54 | 56 | 58 | 59 | 61 | 63 | 65 | 67 |
| 2.4 | 2.9 | 3.4 | 3.8 | 4.3 | 4.7 | 5.1 | 55 | 57 | 59 | 61 | 64 | 65 | 67 | 69 | 72 | 74 |
| 2.6 | 3.2 | 3.7 | 4.1 | 4.7 | 5.1 | 5.6 | 60 | 62 | 65 | 67 | 70 | 71 | 74 | 76 | 78 | 81 |
| 2.8 | 3.4 | 4.0 | 4.5 | 5.0 | 5.5 | 6.0 | 65 | 67 | 70 | 72 | 75 | 77 | 80 | 82 | 85 | 87 |
| 3.0 | 3.7 | 4.3 | 4.8 | 5.4 | 5.9 | 6.5 | 70 | 72 | 75 | 78 | 81 | 83 | 86 | 88 | 92 | 94 |
| 3.2 | 4.0 | 4.6 | 5.1 | 5.8 | 6.4 | 6.9 | 75 | 78 | 81 | 83 | 87 | 89 | 92 | 95 | 98 | 101 |
| 3.5 | 4.2 | 4.9 | 5.5 | 6.2 | 6.8 | 7.4 | 80 | 83 | 86 | 89 | 93 | 95 | 98 | 101 | 104 | 107 |
| 3.7 | 4.5 | 5.2 | 5.8 | 6.6 | 7.3 | 7.9 | 85 | 88 | 92 | 94 | 98 | 101 | 104 | 107 | 110 | 114 |
| 3.9 | 4.7 | 5.5 | 6.2 | 7.0 | 7.6 | 8.3 | 90 | 93 | 97 | 100 | 104 | 107 | 111 | 113 | 117 | 121 |
| 4.1 | 5.0 | 5.8 | 6.5 | 7.4 | 8.0 | 8.8 | 95 | 98 | 102 | 105 | 110 | 113 | 117 | 120 | 124 | 127 |
| 4.3 | 5.3 | 6.1 | 6.9 | 7.8 | 8.5 | 9.3 | 100 | 103 | 108 | 111 | 116 | 119 | 123 | 126 | 130 | 134 |
| 4.5 | 5.5 | 6.4 | 7.2 | 8.2 | 8.9 | 9.7 | 105 | 109 | 113 | 117 | 122 | 124 | 129 | 132 | 137 | 141 |
| 4.8 | 5.8 | 6.7 | 7.5 | 8.5 | 9.3 | 10.2 | 110 | 114 | 118 | 122 | 127 | 130 | 135 | 139 | 143 | 148 |
| 5.0 | 6.1 | 7.0 | 7.9 | 8.9 | 9.8 | 10.7 | 115 | 119 | 124 | 128 | 133 | 136 | 141 | 145 | 150 | 155 |
| 5.2 | 6.3 | 7.3 | 8.2 | 9.3 | 10.2 | 11.1 | 120 | 124 | 129 | 133 | 139 | 142 | 147 | 151 | 156 | 161 |
| 5.4 | 6.6 | 7.6 | 8.6 | 9.7 | 10.6 | 11.6 | 125 | 129 | 135 | 139 | 145 | 148 | 153 | 158 | 163 | 168 |
| 5.6 | 6.8 | 7.9 | 8.9 | 10.1 | 11.0 | 12.0 | 130 | 134 | 140 | 144 | 150 | 154 | 159 | 164 | 170 | 175 |
| 5.8 | 7.1 | 8.2 | 9.2 | 10.5 | 11.5 | 12.5 | 135 | 140 | 145 | 150 | 156 | 160 | 166 | 170 | 176 | 181 |
| 6.1 | 7.4 | 8.5 | 9.6 | 10.9 | 11.9 | 13.0 | 140 | 145 | 150 | 156 | 162 | 166 | 172 | 176 | 183 | 188 |
| 6.3 | 7.6 | 8.9 | 9.9 | 11.3 | 12.3 | 13.5 | 145 | 150 | 156 | 161 | 168 | 172 | 178 | 183 | 189 | 195 |
| 6.5 | 7.9 | 9.2 | 10.3 | 11.6 | 12.7 | 13.9 | 150 | 155 | 161 | 167 | 174 | 178 | 184 | 189 | 195 | 202 |
| 6.7 | 8.2 | 9.5 | 10.6 | 12.0 | 13.1 | 14.3 | 155 | 160 | 167 | 172 | 180 | 184 | 190 | 195 | 202 | 208 |
| 6.9 | 8.4 | 9.8 | 11.0 | 12.4 | 13.5 | 14.8 | 160 | 165 | 172 | 178 | 185 | 190 | 197 | 202 | 208 | 215 |
| 7.2 | 8.7 | 10.1 | 11.3 | 12.8 | 13.6 | 15.3 | 165 | 169 | 177 | 183 | 191 | 195 | 202 | 208 | 214 | 221 |
| 7.4 | 9.0 | 10.4 | 11.7 | 13.2 | 14.4 | 15.8 | 170 | 174 | 182 | 189 | 197 | 202 | 208 | 214 | 221 | 228 |
| 7.6 | 9.2 | 10.7 | 12.0 | 13.6 | 14.8 | 16.2 | 175 | 179 | 188 | 194 | 202 | 208 | 214 | 221 | 228 | 235 |
| 7.8 | 9.5 | 11.0 | 12.3 | 14.0 | 15.3 | 16.7 | 180 | 184 | 194 | 199 | 208 | 214 | 221 | 227 | 234 | 242 |
| 8.0 | 9.8 | 11.3 | 12.7 | 14.4 | 15.7 | 17.1 | 185 | 189 | 199 | 205 | 214 | 219 | 227 | 233 | 240 | 248 |
| 8.2 | 10.0 | 11.6 | 13.0 | 14.7 | 16.1 | 17.6 | 190 | 194 | 204 | 211 | 220 | 225 | 233 | 240 | 247 | 255 |
| 8.4 | 10.3 | 11.9 | 13.4 | 15.1 | 16.5 | 18.1 | 195 | 199 | 210 | 216 | 226 | 231 | 239 | 246 | 254 | 262 |
| 8.7 | 10.5 | 12.2 | 13.7 | 15.5 | 17.0 | 18.5 | 200 | 204 | 215 | 222 | 231 | 237 | 246 | 252 | 260 | 268 |

### Select Median Temperature

It will be discovered that the required bonnet temperature will not be the same for all runs. Therefore, it will next be necessary to analyze the temperatures indicated and to select one temperature that will most nearly meet all needs.

Using the six room and basement house plan previously described as an example, and working out the duct runs on form 9HC, it will be observed that the conditions shown in Table 2 prevail.

Add together the cfm figures for each bonnet temperature found to be required and from these totals the ultimate bonnet temperature and heating cfm will be calculated.

The sample plan shows the following conditions:

Total cfm represented by 170 deg bonnet temperature = 105

Total cfm represented by 160 deg bonnet temperature = 65

Total cfm represented by 130 deg bonnet temperature = 331

Total cfm represented by 120 deg bonnet temperature = 163

The temperatures that have the largest cfm requirements should govern the temperature ultimately used to a greater extent than those temperatures with lesser cfm requirements. Sometimes it will be obvious which temperature should be used, but in many cases this selection will require a mathematical analysis based upon the weight of air handled.

The mathematical analysis as we have found is made by multiplying the cfm at a given temperature by the density (weight of 1 cu ft) of the air at that temperature to determine the weight of the total cfm at the stated temperature. The total weight for all temperatures indicated will then be divided by the total cfm to convert cfm to average density. This average will then indicate the bonnet temperature that should

TABLE 1—AIR density data

| Temperature (deg F) | Density (lb per cu ft) |
|---|---|
| 110 | 0.070 |
| 115 | 0.069 |
| 120 | 0.068 |
| 125 | 0.0679 |
| 130 | 0.067 |
| 135 | 0.0667 |
| 140 | 0.066 |
| 145 | 0.0656 |
| 150 | 0.065 |
| 155 | 0.0645 |
| 160 | 0.064 |
| 165 | 0.0635 |
| 170 | 0.063 |
| 175 | 0.0625 |
| 180 | 0.062 |

cfm × density = lb
lb/cfm = density

TABLE 2—CONDITIONS PREVAILING in sample house

| Run No. | Run Length (ft) | Cool (cfm) | Heat (Btu) | Bonnet Temp. (deg F) | Mathematical Analysis |
|---|---|---|---|---|---|
| 1 | 6 | 93 | 6.0 | 130 | 105 cfm (170 deg × 0.063 = 6.62 lb |
| 2 | 13 | 96 | 6.0 | 130 | 65 cfm (160 deg × 0.064 = 4.16 lb |
| 3 | 14 | 96 | — | — | 331 cfm (130 deg × 0.067 = 22.18 lb |
| 4 | 25 | 61 | 3.0 | 120 | 163 cfm (120 deg × 0.068 = 11.08 lb |
| 5 | 13 | 65 | 5.3 | 160 | |
| 6 | 26 | 102 | 4.8 | 120 | 664 cfm ..... Total ..... 44.04 lb |
| 7 | 37 | 142 | 7.9 | 130 | |
| 8 | 46 | 75 | 7.0 | 170 | |
| 9 | 32 | 30 | 3.1 | 170 | |

be applied to the heat loss to determine the heating cfm. (Air density is shown on the bonnet temperature selection chart and also on page 14 of Manual 9.)

### Determine Bonnet Temperature

Reference to the tabulated data for the sample plan will show that the average density is 0.0663 lbs. This density is nearest to that of 130 deg air (0.067) and would indicate that 130 deg bonnet temperature would be used.

For another example, assume the following conditions:

62 cfm (160 deg) × 0.064 = 3.97 lb
111 cfm (150 deg) × 0.065 = 7.22 lb
178 cfm (140 deg) × 0.066 = 11.75 lb
215 cfm (130 deg) × 0.067 = 14.40 lb
225 cfm (120 deg) × 0.068 = 15.30 lb
791 cfm ..... Total ..... 51.96 lb
52.64/791 = 0.0665 average density

The above analysis does not apply to the sample plan but does present a condition where judgment might not result in the use of the proper bonnet temperature and the mathematical calculation would be the only safe way of making the selection.

This would require 135 deg bonnet temperature but since Manual 9 does not list 135 deg at the present time it would be satisfactory to use either 130 or 140 deg.

If 130 deg is selected, those rooms requiring 140 deg bonnet temperature as determined for the cooling cfm will call for slightly more air for heating than for cooling.

Those requiring 120 deg air will need slightly more for cooling than for heating. Those runs represented by 160 deg and 150 deg bonnet temperatures will show considerably more air for heating than for cooling. This may in some instances require dampering during cooling periods, or on rare occasions, could result in an extra run for heating that would not be used for cooling.

### Consider Temperature Rise

Most winter air conditioning units are designed to use a minimum temperature rise of 70 deg through the unit, or 140 deg bonnet temperature, and for this reason the selected bonnet temperature should not result in air quantities that exceed that required for the 70 deg rise.

To check the maximum allowable cfm of a unit, multiply the rated Btuh at the bonnet by 0.013. If the results are equal to or more than the total heating cfm of the system, we feel the equipment is satisfactorily matched to the job.

Should the allowable unit cfm be found to be less than that required by the system, the system should be designed for its required air volume, and during the heating season added resistance in the form of dampers should be applied to reduce the air volume sufficiently to obtain a temperature rise of 70 deg or more, or the blower speed should be reduced. This method will be satisfactory for perimeter systems.

### Use Bypass Arrangement

When high wall registers or ceiling diffusers are used, we suggest that bypass arrangements be incorporated in the system to allow the full volume of air to be used for both heating and cooling. This method will circulate over the heat exchanger only that quantity of air needed for 70 deg to 100 deg temperature rise and bypass the rest.

The heating cfm may also be determined by again referring to the bonnet temperature selection chart and by proceeding as follows:

1) Locate the column representing the design bonnet temperature selected (130 deg in sample plan).

2) In this column locate the figure that most nearly represents the Mbh (1000 Btuh to be delivered).

3) Cross to the right, and in the duct length column (use nearest 10 ft) read the heating cfm.

*Example*: The bonnet temperature selected is 130 deg. The living room runs are 6 ft and 13 ft long and each are required to deliver 6.0 Mbh. In the 130 deg column it will be found that 6.1 is the nearest figure to the required 6.0 Mbh. In the 10 ft duct length column and on the line containing the 6.1 figure read 100 cfm for heating. Bedroom 2 requires 7.0 Mbh and the duct length is 46 ft. Following the above method it will be found that 133 cfm will be required for heating. Enter the required heating cfm on line 9 and in the heat column.

The bonnet pressure to be used will depend upon the rated capacity of the equipment to be installed. Usually the smaller units will operate against 0.20 in. external pressure and the larger units ordinarily will be designed to handle greater pressures.

### More Pressure on Supply Side

In perimeter heating the supply runs are longer than the return runs. Therefore, it is common practice to use a greater portion of the available pressure on the supply side than on the return side. If the unit is rated at 0.20 in. external static pressure then 0.15 in. may be used on the supply side and 0.05 in. on the return side.

The division may be made in any proportion desired provided the total does not exceed the unit rating.

The equivalent length of fittings is established by adding together the values obtained from pages 6 and 7 of Manual 9. For extended plenum fitting see Manual 7.

The design engineer must recognize the fittings that are required to convey the air from the unit to the outlet and account for their resistance. The greater the equivalent length value the larger the ducts must be to convey the air to the outlet. Good fittings reduce resistance, allow smaller and sometimes fewer runs and thus reduce installation costs.

The total equivalent length is obtained by adding together the measured length from line 6 and the equivalent length from line 11. This total is placed on line 12.

The total of measured duct length and equivalent length of fittings would be better named if it were to be called "Total Effective Length," we are convinced, because the total ft thus obtained exercise the same effect upon air flow as a straight piece of pipe of the same length.

When using high wall registers or ceiling outlets, refer to the manufacturer's data and select the units that

will be required based on the room cfm and the spread necessary to satisfactorily cover the area.

Observe carefully the resistance, or pressure drop required. If the outlet uses up too much of the available pressure there will not be enough left for duct sizing.

When designing for perimeter outlets we suggest that the velocity of the discharge diffuser should provide face velocities ranging between 500 and 600 fpm and that the pressure drop should be between 0.03 and 0.04 in. for the cfm to be delivered. Sometimes lower velocities and pressure drops will have to be used because no smaller diffuser is available.

When baseboard sections are to be used, select short sections that have the required capacities and pressure drop characteristics. However, we recommend the use of floor diffusers if possible, as we feel they provide the most satisfactory system for both heating and cooling. This is one of those rare occasions where we consider the lowest cost system the best.

### Select Diffuser Size

Refer to the manufacturer's catalog and using the cfm per run entered on line 9 of form 9HC (use largest value) select the diffuser size with its accompanying pressure drop. Enter the pressure drop on line 16, the size on line 21, and the location on line 22.

Deduct the diffuser pressure drop from the design bonnet pressure and enter the difference on line 17. Be sure to use only that column containing the largest cfm figure for each run.

*Example*: Assume a bonnet pressure of 0.15 in. and a pressure drop of 0.03 in. for the diffuser. The figure on line 17 would then be 0.12 in.

Because the total equivalent length which represents the resistance against which the air must flow varies for each outlet it is necessary to relate all pressure drops to some common value. Friction charts use 100 ft for this purpose. Reference to Table D of Manual 9 will allow easy selection of the pressure drop per 100 ft required for sizing the ducts. For example, using 0.13 in. as the total pressure from line 17, and a duct equivalent of 107 ft, (bedroom 1) it will be found that 0.12 in. will be required and would be entered on line 18. Thus:

$(0.13 \text{ in.} \times 100 \text{ ft})/107 = 0.12 \text{ in.}$

With an equivalent length of 81 ft (living room 1) the resistance per 100 ft should be 0.15 in. Thus:

$(0.12 \text{ in.} \times 100 \text{ ft})/81 \text{ ft} = 0.15 \text{ in.}$

Select the branch sizes from Table E using the pressure drop per 100 ft just established, and the cfm as recorded on line 9. Enter pipe size on line 19.

Stack sizes are obtained from Table F to correspond with the pipe size required.

# Solving Heat Loss Problems in Hillside Homes

CONTEMPORARY HOMES located in the San Francisco Bay region offer many attractive features from the homeowner's point of view, says Fred Granholt, Albany, Calif. sheet metal contractor. All too frequently, he adds, they provide additional headaches for the warm air heating dealer. An example of some of the problems often encountered in the hillside home is the type of air distribution system required to adequately offset the heat loss from a room with four exposures.

In the photograph of the home shown here, each of the end rooms were exposed to the full force of the weather in four places; the roof, floor, side and front. The greatest source of heat loss is the front with its solid wall of glass.

The floor and roof offer even greater problems than normally encountered in designing a good air distribution system, as the complete exposure of both of these portions of the room rules out their use as a location for ducts needed to carry out the principles of the perimeter heating system which provides heat at the point of greatest heat loss (glass area). The use of the partition walls between the rooms is ruled out — there is no way to bring a duct run to a suitable place in the partition wall, since ducts run beween the floor joist would not be adequately insulated due to the small clearance in this space.

**HILLSIDE HOMES often have greater exposure areas per room than conventional homes. The 16 × 10 × 8 ft bedroom has 528 sq ft of exposed exterior surface**

Problems of this nature are usually overcome, according to Mr. Granholt, by using high sidewall registers in the wall opposite the glass wall and directing the air stream to wipe the entire glass area. However, there are times when both high and low wall registers are required to assure sufficient heat directed to the exposed floor to offset the heat loss from that area.

## *Heating Dealer's Success Formula:*

# Show 'Em the Showroom

**Steady advertising, quality equipment and a top reputation are big contributors to the sales records, but it's the showroom demonstration that clinches sales to 65 percent of interested customers**

WAREHOUSE SALES talk is supported by demonstration of heavy gage metal in a knocked-down unit

ONE DEALER who would rather sell heating in his own showroom than in prospects' homes is C. W. Bouse, Jr. of Reading, Pa.

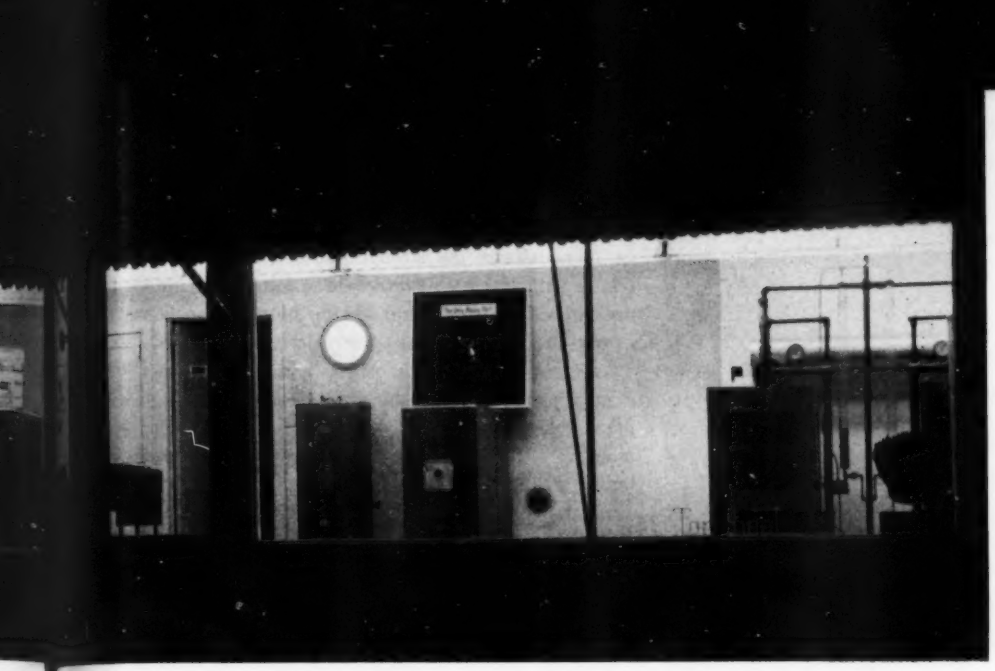
Five years ago C. W. Bouse, Inc. was operating from a shop in the heart of Reading's retail shopping area and was selling heating installations at a rate of about 50 a year. In 1951 the firm moved into a completely new showroom-shop layout at 38th St. and Perkiomen Ave., five miles from the center of the city. He installed operating displays in a brightly lighted, glass front store, and started using these displays as a basic selling tool. Now he's selling more than 100 jobs a year.

Steady institutional advertising, reliable service, and a reputation for quality work have been important factors in the firm's progress. But it is the showroom sales presentation, according to Mr. Bouse, that helps close many deals once prospects are attracted. The firm sells about 65 percent of its seriously interested prospects, even though it sticks to quality work and is often priced higher than competition.

### The Stage is Set

"The showroom is especially valuable in helping us demonstrate why ours is a quality job," Mr. Bouse says, "but there are other general advantages to selling in a showroom.

"In the showroom we always have every possible sales aid — displays, materials, photos, testimonials, specifications and actual units. We're assured of the prospect's full attention in the showroom, without the



**BRIGHT AND ORDERLY showroom has helped C. W. Bouse, Inc. double its heating business in the last five years**

interruptions of visitors, children or phone calls that occur in the home. Because the surroundings are always the same, the showroom presentation can be constantly improved and dramatized, becoming more effective all the time. Finally, we've noticed that some customers feel that a salesman's visit to the home involves some 'pressure' and this produces undue sales resistance; all customers seem comfortable in the 'no obligation' atmosphere of the showroom."

### Approach Built On Presentation

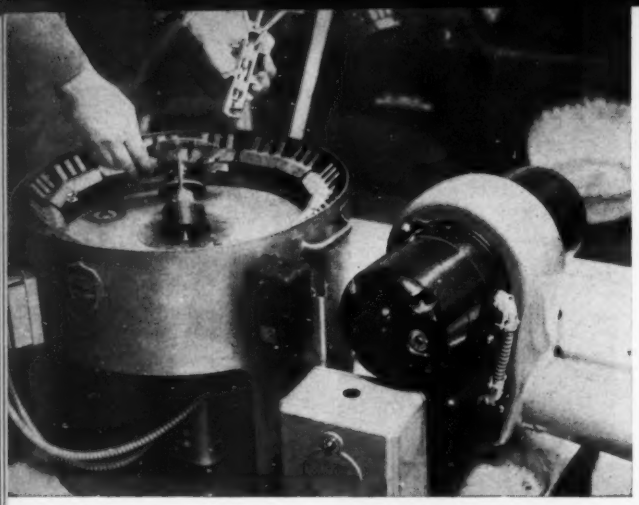
From the time he contacts the prospect until the deal is closed, Mr. Bouse's planned sales approach is built around one effective showroom presentation.

Some prospects first contact the firm by phone, while others drop in at the showroom. In either case Mr. Bouse makes an appointment to visit the home for a survey. (Recently one other salesman has been handling some of the firm's increasing business. He uses the same step-by-step sales method).

Mr. Bouse makes his survey visit brief and professional. He studies the heating plant and the home, then indicates to the prospect what equipment and work will be needed. He mentions an approximate price only if it is earnestly requested. Then he invites the prospect to visit the showroom at some convenient time for an exact price and a detailed explanation of the job to be done.

The salesmanship Mr. Bouse scrupulously avoids in this home visit is used to the fullest in the showroom.

**SHOP SHOWMANSHIP builds quality equipment sales. Mr. Bouse throws fittings to floor in demonstration of superiority of locked seams**



SELLING DISPLAY, in this case an oil burner, supplements sales talks emphasizing quality

Mr. Bouse starts off by giving a detailed explanation of the job he plans to do. He emphasizes that this is not an average job but a quality job in every respect. Then he proceeds to a demonstration of the equipment.

### Quality Work Emphasized

One of the displays is an operating installation of two identical furnaces equipped with two different oil burners, one priced more than $100 higher than the other. Mr. Bouse puts equal amounts of oil into tall glass cylinders that supply fuel to the burners. Then he starts both units at the same time.

With each burner operating, Mr. Bouse explains the difference between the two burners, telling why the one which costs more will actually pay for itself over a period of use through higher efficiency. As the units continue to operate, he presents other aspects of his sales presentation.

After about 25 minutes, Mr. Bouse and the prospect return their attention to the two heating plants. While the oil feeding the less expensive burner is nearly all gone, the tube leading to the quality burner still contains a substantial amount of fuel. The stack temperature in the unit with the cheaper burner is hundreds of degrees higher than in the more expensive unit.

"These dramatic results set the tone for the rest of the presentation," says Mr. Bouse. "The point is made repeatedly that quality workmanship and materials more than repay their extra cost over the years in the form of fuel savings and trouble-free heating."

Using the displays, Mr. Bouse details the quality features of each piece of equipment in the planned job.

### Demonstrations Spiced by Showmanship

The shop and basement warehouse are used too, in his sales presentation. He takes prospects to look at an actual, knocked down unit of the type specified for the job, especially pointing out the heavy gage metal of which it is constructed.

In the shop, he explains the quality that is added by careful workmanship in sheet metal fabrication. Often he demonstrates the strength of better-made fittings by taking some with Pittsburgh lock joints and others that are not so well made and tossing both on the floor. The poorly made fittings frequently loosen or break.

"It may seem a little corny," Mr. Bouse says, "but a man planning to spend a lot of money on a heating plant takes every little detail seriously. A little showmanship that gets across a point and at the same time lightens the air is very helpful."

After the outline of the job and review of the materials, Mr. Bouse adds to the effect of the presentation by demonstrating the reliability of the firm. He describes its prompt service, offered on a 24 hr, seven day basis. He shows photos of jobs he has done, and also shows exterior photos of the homes and written notes from satisfied customers. His last and most effective point on reliability is to give the prospect the names of some neighbors or co-workers whose heating plants the firm has installed, recommending that the prospect ask these people about their jobs. Because of the quality of material and workmanship which have gone into each installation, the company always gets a good recommendation.

### Low Pressure Selling Just As Effective

"This whole presentation takes an average of two hours," Mr. Bouse says, "and it's usually given on a weekday evening or Saturday. By the time it's over, most customers are pretty well sold. But since we don't use any high pressure methods to close deals, only a few decide on the spot to go ahead. Most of them want to give it a little more thought and call us."

When Mr. Bouse opened his showroom and started using his current sales methods, he sold the first 21 consecutive jobs before losing a prospect. Since then the average has gone down to about 65 percent, but this was expected as the firm has attracted increasing numbers of prospects from a variety of sources.

"While the better quality job we do is most easily sold to the family of more than average means," explains Mr. Bouse, "we do sell a certain number of jobs to people of moderate income who stretch their budgets because they can appreciate a quality heating job. By avoiding too much qualifying of prospects, we make more sales presentations, but we do sell quite a few more jobs."

Recommendations are the firm's chief source of new business, but the showroom brings in some prospects from the four-lane highway it faces and the firm's regular advertising accounts for others. Newspaper ads and radio commercials are simple, stress quality as their main theme, never mention a price, and have mostly institutional effect.

"Folks who want a good job hear of us one way or another," Mr. Bouse says, "and we use our showroom to prove they heard right."

SMCNA OFFICERS are (from left): Charles H. DeLaughter, treasurer; Nat N. Leas, second vice president; Dee Cramer, retiring president; Paul Stromberg, president; W. A. Kuechenberg, first vice president; Clarence J. Meyer, third vice president

# SMCNA Talks Costs, Collections and Contracts

**Forums, conferences and panel discussions are provided at 12th annual convention for contractors and dealers to clear up their problems on business administration**

MEETING in San Francisco April 26 to 30, members of the Sheet Metal Contractors' National Association elected Paul Stromberg of Washington, D. C. as president. Other officers elected are: first vice president, W. A. Kuechenberg, Chicago; second vice president, Nat N. Leas, Fresno, Calif.; third vice president, Clarence J. Meyer, Buffalo; treasurer, Charles H. DeLaughter, Oklahoma City. Elected to the board of directors for three years were Andrew Stuart, Providence, R. I.; Walter A. Limbach, Pittsburgh; Glenn Angerman, Denver; and J. Frank Park, Los Angeles.

After the usual general business had been handled, the convention sessions were turned to finding ways and means by which the high standards of the industry could be maintained at a more favorable percentage of profit for the contractor. Charles H. DeLaughter, chairman of the cost and estimating committee and moderator of the business management seminar, said:

"The main concern in our industry today is *costs* — it was the same last year, it will be the same next year. The costs of raw materials cannot be controlled and the costs of labor are set due to wage rate agreements; thus, the only way left to reduce operating expenses is to cut the cost of doing business through good business administration. The most satisfactory way found to date has been an accurate cost accounting system because through this method of keeping books it can be learned where certain functions of the business are exceeding what is considered a satisfactory level. When

AT THE END of the day the New York state contingent relaxes with song; Left to right F. Van Pils, Clarence J. Meyer, W. C. Steinhorst, W. L. McAfee, Richard W. Friday, J. A. Heaphy. Helping out at the piano are Mrs. H. F. Barnes and Mrs. F. V. Pils

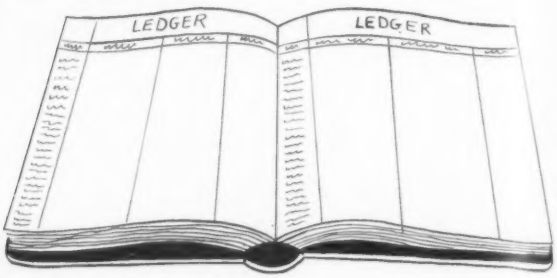
FIRST TO CONGRATULATE the new president, Paul Stromberg (right) is Dee Cramer, immediate past president

RECOGNITION for outstanding service during his term of office is extended past president Dee Cramer by Richard E. Walsh

discrepancies are found, the necessary steps to strengthen the operation can be taken."

### Books Must Stand Check

Mr. DeLaughter also pointed out that federal, state and local governments require the modern businessman to maintain a set of books that will stand examination at any time by official inspectors to prove that any or all of the various requirements of social security, unemployment, compensation insurance, sales tax and federal and state income tax laws are being fully complied with.




After naming the many headings under which a contractor must list his payments to government, Mr. DeLaughter said that in many ways these requirements had a good effect on the bookkeeping systems used by the contractors because it required very little additional work to round out the accounting system to provide the other information that can be used to determine the costs of doing business. Quoting from the *Research Institute of America*, he said, "A saving effected by a bookkeeping or accounting department of $100 in the taxes paid is equivalent to the performance on a $25,000 contract sale." This, he said, has proven to be true in the sheet metal field.

### Financial Statements Prove Value

The use of proper financial statements, he said, will help with the obtaining of credit, point up the need for collections of outstanding and overdue accounts, provide tax information on short notice and give the contractor a quick picture of how the business is going financially; if costs are moving out of line they can be checked before they become a liability.

Discussing estimating procedures, Mr. DeLaughter recommended that a complete breakdown of all items to be provided under the contract be shown on a printed estimating form. He advised against the use of note paper and other haphazard methods and gave several examples to prove his point that these methods are not satisfactory ways to conduct a modern business. He suggested that when submitting a price for a job, every proposal should contain specifically the items the contractor proposes to install as well as the statement that the installation of additional equipment or the performing of any alteration work can be done only upon the execution of

a rider contract. It is also advisable, he said, to designate the section and paragraph of the original specification when preparing the proposal.

Contractors have an excellent legal tool in the Mechanics Lien Law to aid them in collection of unpaid bills for work completed, according to John Demling, Chicago attorney. Mr. Demling pointed out that the first rule a contractor should follow is obtaining work permits from municipal governments for all jobs because any legal action taken by a contractor to collect for services must be backed by compliance with the law.

### Use Lien Laws

The use of lien laws is most effective, according to Mr. Demling, when a subcontractor is attempting to collect from prime contractors. The legal definition of a prime or subcontractor is often misunderstood, he said, and stated as an example that sheet metal contractors often believe themselves to be subcontractors when they are actually prime contractors. The legal interpretation of a situation in which a general contractor is acting as agent for the building owner on a fee basis places all other contractors in the position of having a direct contract with the owner, he explained, and therefore the contractor performing the services has a prime contract. The understanding of this point is especially important since most lien laws require different steps to be taken by a contractor, depending on whether he is a subcontractor or prime contractor.

Acceptance of a contract containing a no lien clause does not necessarily mean that the failure to receive payment for services rendered to the owner of property will cause the sheet metal contractor to lose the compensation he is due. According to Mr. Demling, the sheet metal contractor can still enter a claim against any fund that may not have been used at the time such a lien claim is filed. Where personal serving of a notice of lien against property is a law, the use of registered mail is not sufficient evidence of personal service. Thus, it was advised that the sheet metal contractor or his attorney make the actual presentation of notice of lien claims to the building owner and to record the time, date and reaction of the person receiving the notice on a copy of the notice for future reference, in case it becomes necessary to "prove up" the serving of the notice.

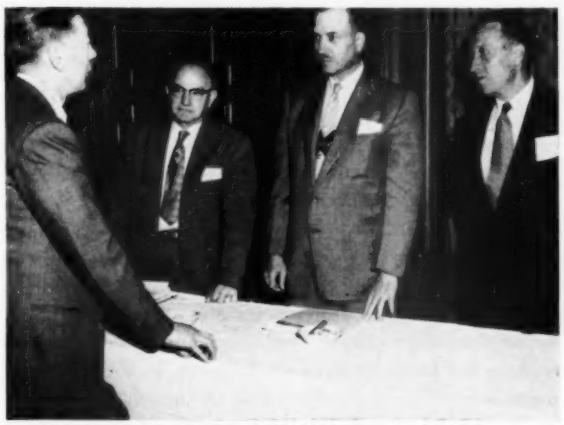
### Insurance Queries Answered

At the 1954 convention, Richard W. Friday, chairman of the contractor insurance committee, made a complete report on the types of insurance available to sheet metal contractors. During the past 12 months many contractors have written him regarding specific details relating to certain conditions they had encountered. This year's insurance report covered some of these questions.

One question received was: "My service men drive their own cars on calls. They are not paid extra for the use of their cars. Am I responsible if they have an ac-

RECEIVING HER CORSAGE is Mrs. Steve Raymond (center). Mrs. Nat N. Leas (right) pins while Mrs. Dee Cramer watches.

SCENIC TOUR of harbor was enjoyed by all, as typified by Lawrence O. Paul and family



PANEL DISCUSSES warm air heating problem with member of the audience. From left: Roy M. Burk, C. A. Pfahl, Bernard Lawrence, Robert P. Johnsen

BUSINESS MANAGEMENT seminar hears William H. Bowe (left) explain the wholesaler's position, while C. A. DeLaughter and Richard W. Friday check notes

cident?" The answer, according to Mr. Friday, is "yes" and the owner should be protected by a non-ownership policy.

### Non-Ownership Policy Defined

Continuing the explanation of the value of a non-ownership policy, Mr. Friday gave an example of a condition that frequently occurs. He said, "You may be involved in a case where you might require non-ownership liability coverage even though you feel certain that no such case could involve your company. For instance, one of your employees, in an effort to do a good job and to save time, might get in his car and drive to a hardware store to make a small purchase in lieu of going back to the shop or calling in for a delivery of some certain required item. His action might mean considerable saving to you on this particular job but, if he were to become involved in an accident when performing this action in your behalf (with or without your knowledge) then the value of such coverage as given in a non-ownership policy is made most apparent. In any case where an employee does some service for you — with or without your knowledge — he is a legal agent for you."

Other questions dealt with similar cases and the apparent responsibility of the sheet metal contractor was pointed out. Another point made by Mr. Friday dealt with the filing of accident reports. He said "Did you ever notice that when certain stories are published in newspapers, the writer often uses the term 'It is alleged' or 'John Doe alleges'? By doing this the newspaper says all in one word that there may be a question as to the truth. The statement is not a fact as yet because it hasn't been proven.

"Think how much easier it might be to prove a claim false if, instead of saying in an accident report, 'He fell down the stairs and broke his leg' you said 'He alleges that he fell down the stairs and broke his leg.'

"The implication in the first statement is that you were a witness to the accident; in the second statement you are reporting only what was told you. The wording of a report often becomes important in the settlement of accident cases."

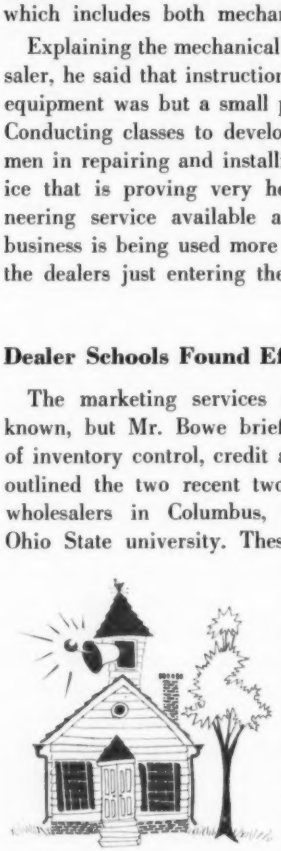
### Wholesaler's Place in Industry

The position of the warm air heating wholesaler in this industry was described by William H. Bowe, Jr., president, National Heating & Air Conditioning Wholesalers' Association, Inc. Mr. Bowe said that the wholesaler has a purpose beyond that of a supplier of tools and equipment. He said that the other purpose is *service* which includes both mechanical and marketing.

Explaining the mechanical service offered by the wholesaler, he said that instruction in the use of new tools and equipment was but a small part of the service available. Conducting classes to develop proficiency among service men in repairing and installing equipment was one service that is proving very helpful to dealers. The engineering service available at the wholesaler's place of business is being used more and more, especially among the dealers just entering the residential cooling market.

### Dealer Schools Found Effective

The marketing services of the wholesaler are well known, but Mr. Bowe briefly reviewed the importance of inventory control, credit and sales promotion. He also outlined the two recent two-day schools held by seven wholesalers in Columbus, O. with the assistance of Ohio State university. These schools covered many of the problems encountered in business management and estimating and were very favorably accepted by the 42 dealers attending each school. He also described the efforts of the National Heating & Air Conditioning Wholesalers Association to establish similar schools for dealers and contractors throughout the country based upon the information obtained at the two Columbus schools.



The winners of the 1954 contest conducted by the National Joint Sheet Metal Workers Apprenticeship committee were announced by Frank Kramer, committee chairman, who outlined in his address the purpose of the annual contest and how the winners were selected. Mr. Kramer said selection of this year's winners was more difficult than in the past due to the high degree of skill shown by the contestants. The winner of the first prize plaque was Paul O. Johnson, Albuquerque , N. M.;

second prize winner was C. E. Lancaster, Port Wentworth, Ga.; and third prize went to William Hertel, Evansville, Ind. An honorable mention certificate was given to Gerald Hekhuis of Grand Rapids, Mich.

Awards were also given for the best training program conducted by local joint apprenticeship committees. The winner of the 1954 award was the Local Joint Apprenticeship Committee of Stanislaus County, Calif. John Hochstatter of Modesto accepted the plaque. An honorable mention certificate was awarded the Detroit Area Sheet Metal Workers' Joint Apprenticeship committee.

### Contractor Sells Skill

The value of apprenticeship training to the sheet metal industry was brought out by W. F. Patterson, Director, Bureau of Apprenticeship, U. S. Department of Labor, who said, "The sheet metal industry is one in which skilled labor costs in nearly every instance exceed the cost of materials. In other words, the sheet metal contractor is primarily selling skilled workmanship. Sound training for workers employed in the industry therefore assumes unusual importance.

"I am sure that everyone here will agree with me that competent layout men, estimators, and skilled sheet metal workers can't be picked up from the ranks of handymen. Such skilled workers are the products of planned training and experience.

### Teamwork is Key Factor

"Without question you will agree that development of artisans for sheet metal industry can best be accomplished through teamwork — teamwork on the part of contractors, labor, state apprenticeship agencies, the Bureau of Apprenticeship, and state and local boards for vocational education.

"National contests, such as the one conducted by your joint apprenticeship committee, have a threefold benefit: They bring your contractors and the unions together in cooperative efforts at both the national and local levels; this cooperation has had a far-reaching effect in building and cementing working relationships of a high order. They help to stimulate local joint apprenticeship committees and inculcate in your future craftsmen the value of skill and accuracy and an appreciation of a job well done. The widespread publicity given such contests helps to bring about a better public understanding of the aims, methods and accomplishments of your industry in apprentice training."

A seminar on warm air heating and residential air conditioning was moderated by Bernard Lawrence, chairman of the warm air heating and cooling committee. On the panel were Robert P. Johnson and C. A. Pfahl. Mr. Johnson stated his opinions on the value of local associations setting up their own standards that a properly installed warm air heating system should be capable of measuring up to and the enforcement of the standards by the association membership. He pointed out that the value of membership in an association dedicated to upgrading the industry amounts to much more than the annual dues paid.

WISCONSIN DELEGATES and families hold extemporaneous supper party on evening given to dining out

He feels the activity of the local association to which he belongs, the Air Conditioning Contractors' Alliance, (Chicago area), has resulted in an increase in selling price of between 10 and 15 percent above the price of the low bidder. The supervision over the association's membership has proven that good warm air heating systems that cost more can be sold in the face of the price cutting policies of many contractors who do not belong to the association.

One of the points association members endeavor to impress upon the people buying heating systems is the value of following the recommendations made in the manuals published by the National Warm Air Heating and Air Conditioning Association. Too often the people quoting the low price cannot offer the same type of heating system recommended by NWAHACA; by installing abbreviated systems the price can be reduced. The members of the Air Conditioning Contractors Alliance have pledged themselves to install systems according to the manuals' recommendations. He concluded with the suggestion that other associations could benefit by setting up similar plans in their areas.

In a report on the progress made during the past year toward a revision of the National Board of Fire Underwriters' *Pamphlet* 90 in relation to the clearances required for furnace installations, C. A. Pfahl told about the recent tests completed at Michigan State college with the assistance of the SMCNA committee on warm air heating.

The results of the extensive set of experiments show that the clearances required in the present NBFU *Pamphlet* 90 are greater than those required for modern furnaces. A suggested revision of the pamphlet has been made and has a good opportunity of being accepted by the NBFU's committee on this subject. The official acceptance of such changes will be reported in American Artisan as soon as they become available.

# Magic of Electronics Sells Control Circuits

**Basic characteristics of the indoor-outdoor thermostat — the "automatic" flavor of the term, simplicity of installation and sensitivity to outdoor conditions — are the device's strongest selling points**

EVERYBODY LIKES automatically operated equipment. This is evidenced by the large number of automatic washing machines sold each year and the increasing number of cars being manufactured with automatic transmissions. Automatization, like the TV antenna, is an American symbol of social achievement. Automatically operated equipment also performs many services for its owners that become accepted practices. One such piece of equipment is the electronically controlled temperature thermostat.

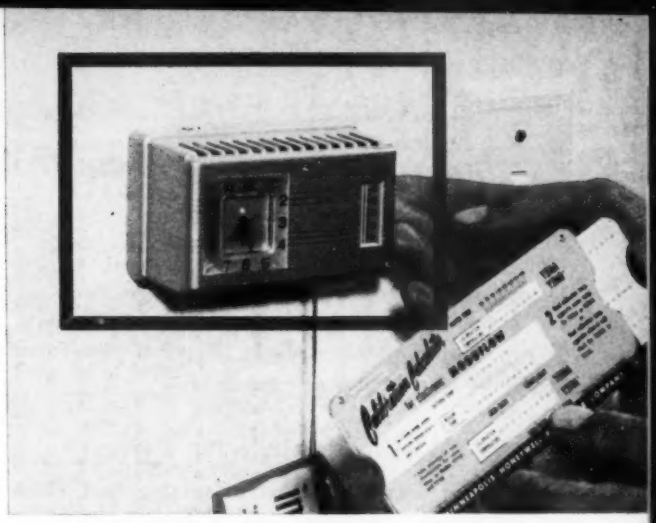
### Not So Mysterious

The term *electronics* has a magic appeal to those who cannot be expected to grasp its theories, but for those who are supposed to understand its mysteries and do not, it seems to be a thing to avoid. The dictionary defines *electronics* as "the physical science dealing with the action of electrons in cathode-ray tubes." An analysis of the devices used in warm air heating systems employing electronic control reveals the enlightening fact that the control system used is very much like any other electrical circuit with the exception of the electronic tubes used to smooth out the electrical impulses and to obtain closer control over the temperature in the building because of the increased sensitivity.

A comparatively recent application of electronics to provide an automatic service for the homeowner is its adaption to an inside-outside control system. This circuit is based on the theory that with a decrease in outside air temperature, the rate of heat loss from the building increases; thus a temperature sensitive element located on the outside of the building will automatically adjust the heating system to provide the extra heat required without permitting the inside air temperature to fall to a point where it becomes uncomfortable. The system responds in the same manner with

GENERAL MANAGER Harry Zieky starts on his way to inspect a new installation — a major aspect of his job

By W. L. Wilson
Manager, Heating Controls Div.,
Minneapolis-Honeywell Regulator Co.



CALIBRATION CALCULATOR is used by installer to determine setting on clock thermostat from indoor and outdoor temperatures

an increase in outside air temperature by adjusting the heating plant's output to a point where overheating will not occur.

### Installation Is Simple

The Standard Sheet Metal Works, Hartford, Conn., is one warm air heating company that is using the magic term of *electronics* to sell the home owner on its recommended control circuit. This firm sold over 200 such installations in 1954. Harry Zieky, general manager, says, "Electronic temperature control systems can be installed by a heating dealer easily and economically."

Besides installing more electronic control units than any other firm in the Hartford area, Standard Sheet Metal was probably the first in the Northeast to use electronics to control year 'round temperature. It put in the first such unit in the *Hartford Times*' "House of the Year." Although New York newspapers gave it a volume of publicity, Harry Zieky treats the "House of the Year" installation casually.

CREATING HEATING systems is a responsibility of Engineer Ray Miller as well as two draftsmen and two other mechanical engineers

### A Short Step from Heating

"It was a new development in home temperature controls, to be sure," explains Mr. Zieky. "But we'd been installing its predecessor — the electronic control system for heating — for a few years. It just naturally fit into our way of doing things."

A look around Standard's shop and a few minutes on a heating system installation job with one of his crews and you quickly get the idea that Standard's way is easy and efficient. Mr. Zieky has managed the business for 17 years. He and his firm's president, C. J. Scala, supervise more than 50 employees, including 40 sheet metal workers, two mechanical engineers, three salesmen, three draftsmen and three electricians. From sales to service they knit well together. Consider, for example, Standard's handling of electronic control sets.

"Nothing to it," says Harry Zieky. "Only three men work on an electronic system installation. They move

NUMBER THREE man on installation crew is serviceman who calibrates the relay

## *"Installing controls is essentially a wiring job . . . Anyone who can wire electric controls can wire electronic controls"*

right in after the heating plant is installed. One is an electrician. Another is his helper. These two wire and install the parts of the control system. The third man — a serviceman — checks the whole installation and calibrates it."

### Essentially a Wiring Job

Mr. Zieky pointed out that before Standard Sheet Metal started installing this type of control system the installing crew followed the same routine when making other control installations. "In other words," he said, "we haven't had to increase the size of our control installation crews. The crews don't operate any differently. Installing controls is essentially a wiring job. Wiring the electronic sets is much like wiring electric controls — except, of course, you now wire in an outdoor thermostat, too. This meant that no training program was needed when we switched to electronic controls. Anyone who can wire electric controls can wire electronic controls. The fact that the control is electronic does not change your method of installation."

At Ridgewood Acres, a development of $15,750 to $17-750 homes in West Hartford, a Standard Sheet Metal crew had finished the ductwork for a heating system when we arrived. The control installing crew had just finished the wiring, and was ready to install the three principal parts of the control system.

### Three Instruments Installed

The first device was a familiar one — a clock thermostat. The crew picked a spot in a hall off the living room about 4½ ft from the floor.

The second step was installation of the outdoor thermostat. Its job is to sense any minute change in temperature. Each change is sent to the third instrument — the electronic relay.

In the electronic control system, he explained, the furnace knows (via the relay) when it's going to get colder inside the house long before the cold air gets inside. In the Ridgewood Acre home, the outdoor device was put on the north side of the house near the northwest corner. Here is where the prevailing Hartford weather would make its nastiness felt first.

### Relay and Amplifier Unit is the Key

The last major device to be installed is the relay and amplifier assembly. This is the key to the system; it's the reason the system is called electronic. Here is its function: First, it receives information — from both the indoor and outdoor thermostats, about changes in temperature. It then translates these changes of temperature into "calls" for heat — or in the case of rising temperature the unit turns the furnace off.

The relay will not call for heat indiscriminately just because the outside temperature is falling. Perhaps the home owner is having a large party — lots of lights on, kitchen stove going full blast or a fire in the fireplace. Chances are then that the temperature in the house is above the normal control point. If this is the case, the relay will watch for a change in the house temperature. It will also be sure that the outside temperature drop is a definite trend. When it is certain, it will turn the furnace on. And for every 20 deg drop in outdoor temperature it will raise the indoor control point one deg.

This is one answer to the problem of *cold wall magnetism*. The system provides extra heat to offset the increased cold in walls that *pulls* heat from the body.

One key part in the relay-amplifier assembly is a cycler. It provides a minimum *on* time in proportion to the severity of the weather. And it meters the correct amount of heat input to match heating requirements.

How does the system work?

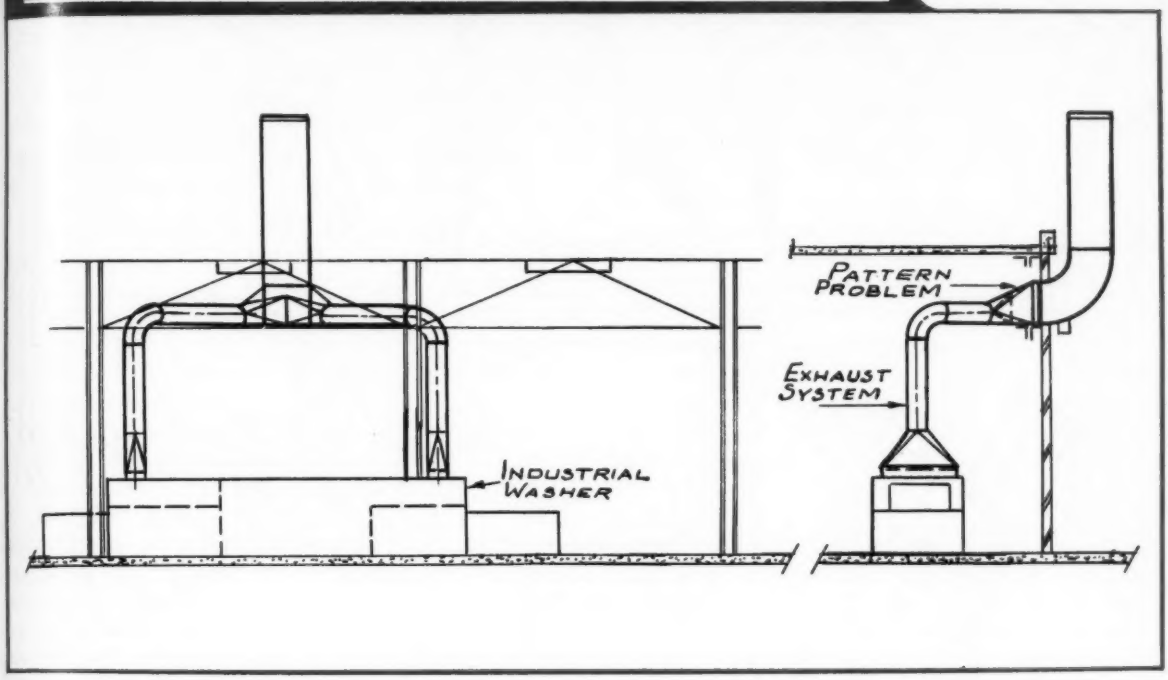
Through electronics the relay-amplifier assembly picks up changes in temperature recorded by either the sensitive indoor or outdoor thermostats. Through electronics — which simply means the use of vacuum tubes in the control system — the slight signals denoting a temperature change can be boosted to operate a relay switch which controls heating plant operation.

### The Serviceman Takes Over

Immediately after an electronic system is installed by the electrician and his helper, the third man of the Standard Sheet Metal installation team — the serviceman — checks the system.

His primary job is calibrating the new installation. Standard Sheet Metal depends on him to keep service calls on the installation low. If the system is properly calibrated, control service calls are low, Mr. Zieky reports. Actually, he says, the calibration is an easy operation. The serviceman follows a formula prescribed by the manufacturer and adjusts it according to a calibration calculator provided with each set. He determines the calibration by determining the outdoor and indoor temperature at the time of adjustment.

Mr. Zieky emphasized that none of the installation or service work done by his crews has anything to do with the electronic mechanism of the control system. This is taken care of when the equipment is designed at the factory.




**1A** FRONT VIEW and . . . **1B** END VIEW of industrial washer vent stack with two horizontal runs connected to existing square duct wall stack

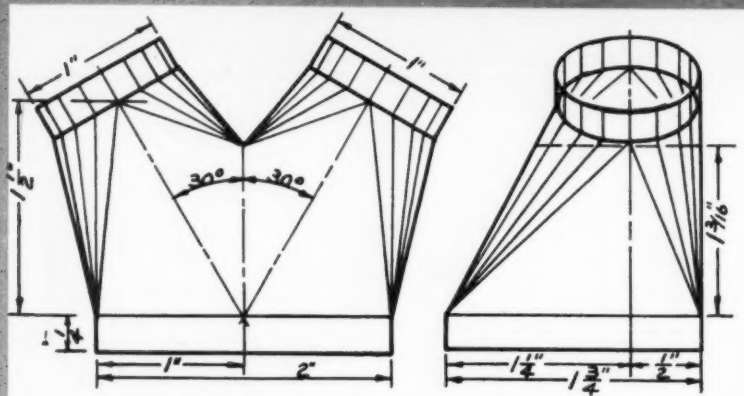
# Developing a Rectangular to Two Round Offset Wye Branch

***For applications where moisture entrainment is a problem, the elimination of water pockets assures longer life for duct fittings***

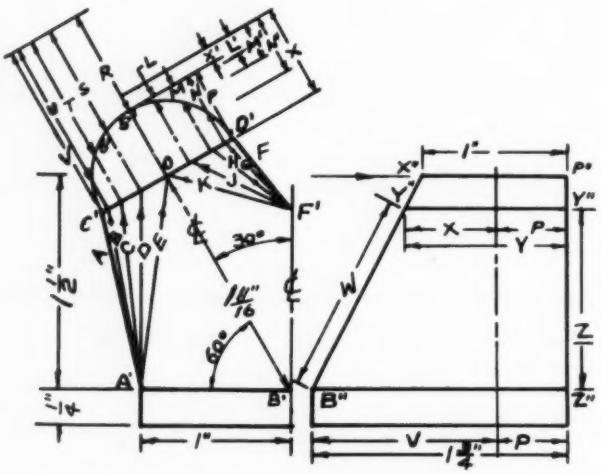
ON INDUSTRIAL washer applications and other exhaust systems in which a high moisture condition is a major design factor, all fittings used in the duct system must be designed to eliminate water pockets.

The practical solution for the situation shown in Figs. 1A and 1B is the square to two round duct fitting with a straight side. It will also be necessary to install a drain at the elbow turn.

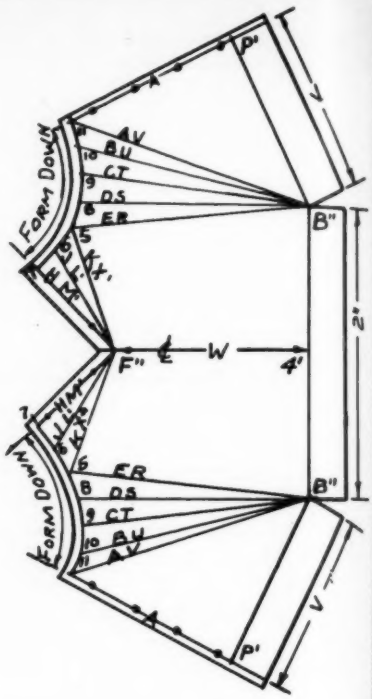
In analyzing the practical, simplified method of layout for a problem of this type fitting, it is noted that the fitting is symmetrical about the center line on the front view (Fig. 2A.) On the end view (Fig. 2B) the offset side is longer than the straight side. Also, the widths V, P and X (Fig. 4) must be determined before the fall lengths between the developed lines and the half circle can be established. This would necessitate the drawing of the partial end view (Fig. 4).



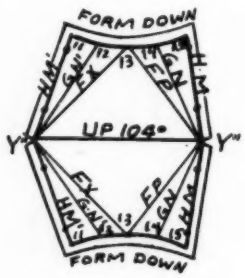

**2A** FRONT VIEW and . . . **2B** END VIEW of fitting



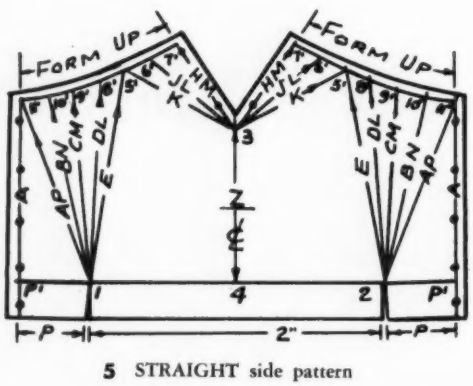

**3** HALF FRONT pattern **4** PARTIAL END view



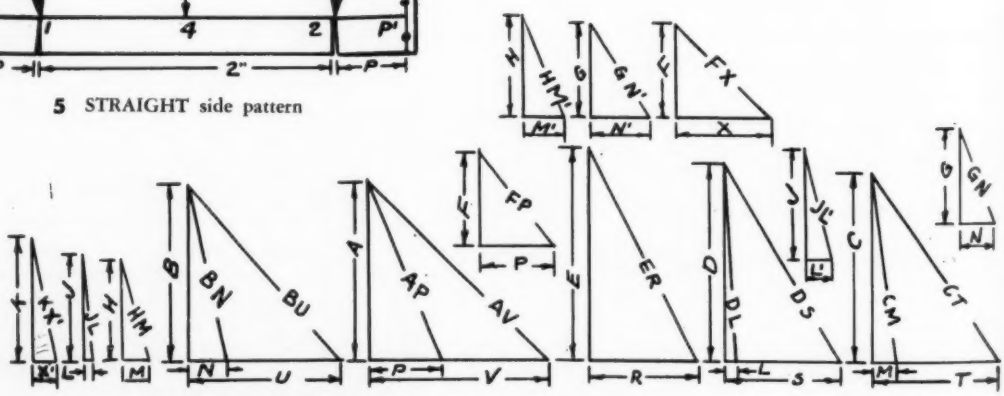

**6** OFFSET side pattern




**7** CROTCH pattern




**5** STRAIGHT side pattern




TRUE LENGTH and developed lines for pattern layout

From the combination of the width lines V, P and X (Fig. 4) set off in their proper relationship to the half circle (Fig. 3), all the true length lines can be developed to solve the pattern layout problem.

Given the front end views of a rectangular to round wye branch, lay out the patterns using the simplified method by the following procedure:

**The Simplified Drawing, Figs. 3 and 4 —**

(*a*) Draw the horizontal line A′-B′, which is 1 in. From B′ draw a line at 60 deg to line A′-B′. Measure 1 11/16 in. on this line and mark the point O. Through point O, draw a line perpendicular to and extending on both sides of line O-B′. Also draw a vertical line from point B′. Measure 1¼ in. up this line and establish point F′.

(*b*) From points B′, F′ and O (Fig. 3) draw lines to the right and perpendicular to center line B′-F′. (This is the beginning of the development of Fig. 4.) On the line drawn from point B′, establish the point B″ and from this point measure length 1 ¾ in. and mark the point Z″. From Z″, draw a line perpendicular to line B″-Z″ to intersect the line drawn from point O (Fig. 3). Mark this point P″. Measure 1 in. to the left of point P″ and mark the point X″. Draw the lines X″-B″ and X″-P″. Divide line X″-P″ into two equal parts (½ in.) and put in the vertical center line between lines X″-P″ and B″-Z″. At the point where the horizontal line drawn from point F′ (Fig. 3) intersects lines P″-Z″ and X″-B″ mark the points Y″. Mark the distance between the center line (Fig. 4) and point Y″ (left) with the letter X and from the center line to point Y″ on the right, with the letter P. Mark the distance from point B″ to where the center line crosses line B″-Z″ as distance V.

(*c*) With O as center (Fig. 3) and radius ½ in., draw a half circle and where the half circle terminates on the diameter line establish points C′ and D′. Divide the half circle into eight equal spaces; through the points draw extended lines to intersect the diameter line C′-D′ and extend above the equally spaced points on the half circle. Measure line lengths V, P and X on Fig. 4 and transfer these lengths to the extended center line above point O on Fig. 3. Through length V on the center line (Fig. 3) draw a line to the left and perpendicular to line B′-O, and mark the extended line lengths from the half circle to this line with the letters R, S, T, U, V.

(*d*) Draw lines through lengths P and X to the right of the center line, and mark the extended line lengths from P to the equally spaced points on the half circle L, M, N, P. Mark the line lengths from X to the equally spaced points on the half circle with the letters X′, L′, M′, N′, and X.

(*e*) From points A′ and F′, draw lines to the intersection points of the extended lines on the diameter line, and mark the lines A, B, C, D, E, and F, G, H, J, K.

(*f*) On Fig. 4 mark the distance between line B″-Y″ as length W, and the distance between line Z″-Y″ as length Z.

**To Lay Out the Straight Side Pattern, Fig. 5 —**

(a) Draw a 2 in. horizontal line and mark the ends 1 and 2. From 1, measure 1 in. to the right and mark the point 4. Through point 4 draw a line perpendicular to line 1-2. From Fig. 4, transfer length Z to the perpendicular line and mark the point 3.

(b) Set a compass at line length E (Fig. 3) and with points 1 and 2 (Fig. 5) as centers, draw arcs. With line length K (Fig. 3) as radius and point 3 (Fig. 5) as center, cut the arcs and mark the points 5′.

(c) Draw a right angle. Transfer line J from Fig. 3 to the vertical leg and fall distance L to the horizontal leg. The hypotenuse line JL is the developed line. With point 5′, Fig. 5 as center and radius JL, draw arcs above and to the right and left of point 5′. With equal space 5′-6′ (Fig. 3) as radius, and points 5′ (Fig. 5) as centers cut the arc JL and mark the points 6′.

(d) Transfer line H and fall distance M from Fig. 3 to the vertical and horizontal legs of a right angle. The hypotenuse HM is the developed line. With points 3 (Fig. 5) as center and radius HM, draw arcs to the right and left of points 6′. With arc 5′-6′ (Fig. 3) as radius and point 6′ (Fig. 5) as center, cut the arcs HM and mark the points 7′.

(e) On a right angle, transfer line D and fall distance L (Fig. 3) to the vertical and horizontal legs. The hypotenuse DL is the developed line. With points 1 and 2 (Fig. 5) as centers, and radius DL, draw arcs to the right and left of lines E. With arc 5′-6′ (Fig. 3) as radius, and points 5′ (Fig. 5) as centers, cut the arcs DL and mark the points 8′.

(f) The line C and the fall distance M are transferred from Fig. 3 to the vertical and horizontal legs of a right angle. The hypotenuse line CM is the developed line. With points 1 and 2 (Fig. 5) as centers, and radius CM, draw arcs to the right and left of lines DL. With equal space 5′-6′ (Fig. 3) as radius, and points 8′ (Fig. 5) as centers, cut the arcs CM and mark the points 9′.

(g) From Fig. 3, transfer line B and fall distance N to the vertical and horizontal legs of a right angle. The hypotenuse BN is the developed line. With points 1 and 2 (Fig. 5) as centers, and radius BN, draw arcs to the right and left of lines CM. With equal space 5′-6′ (Fig. 3) as radius, and points 9′ (Fig 5) as centers, cut the arcs BN and mark the points 10′.

(h) Measure line length A and fall distance P (Fig. 3) and transfer these to the vertical and horizontal legs of a right angle. The hypotenuse line AP is the developed line. With points 1 and 2 (Fig. 5) as centers, and radius AP, draw arcs to the right and left of lines BN. With equal space 5′-6′ (Fig. 3) as radius, and points 10′ (Fig. 5) as centers, cut the arcs AP and mark the points 11′.

(j) With line length A′-C′ (Fig. 3) as radius, and points 11′ (Fig. 5) as centers, draw arcs to the right and left of points 1 and 2. With line P (Fig. 3) as radius, and points 1 and 2 (Fig. 5) as centers, cut the arcs A and mark the points P′.

**To Lay Out the Offset Side Pattern, Fig. 6 —**

(a) Draw the 2 in. vertical line B″-B″. From B″, measure 1 in. and mark the center point 4′. Through this point draw a line to the left and perpendicular to line B″-B″. From Fig. 4, transfer length W to the perpendicular line and mark the point F″.

(b) Draw a right angle. Transfer line E (Fig. 3) to the vertical leg and fall distance R to the horizontal leg. The hypotenuse line ER is the developed line. With points B″ (Fig. 6) as centers, and radius ER, draw arcs to the left of points B″.

(c) Transfer line K and fall distance X′ from Fig. 3 to the vertical and horizontal legs of a right angle. The hypotenuse line KX′ is the developed line. With point F″ as center, and radius KX′, cut the arcs ER and mark the points 5.

(d) On a right angle, transfer line J and fall distance L′ from Fig. 3 to the vertical and horizontal legs of a right angle. The hypotenuse line JL′ is the developed line. With point F″ as center, and radius JL′, draw arcs to the left of points 5. With equal space 5′-6′ (Fig. 3) as radius, and points 5 (Fig. 6) as centers, cut the arcs JL′, and mark the points 6.

(e) The line H and the fall distance M′ are transferred from Fig. 3 to the vertical and horizontal legs of a right angle. The hypotenuse HM′ is the true length line. With point F″ (Fig. 6) as center, and radius HM′, draw arcs to the left of points 6. With equal space 5′-6′ (Fig. 3) as radius, and points 6 (Fig. 6) as centers, cut the arcs HM′, and mark the points 7.

(f) Transfer line D and fall distance S from Fig. 3 to the vertical and horizontal legs of a right angle. The hypotenuse line DS is the developed line. With points B″ as centers and radius DS, draw arcs above and below points 5. With equal space 5′-6′ (Fig. 3) as radius, and points 5 (Fig. 6) as centers, cut the arcs DS and mark the points 8.

(g) From Fig. 3, transfer line C and fall distance T to the vertical and horizontal legs of a right angle. The hypotenuse CT is the developed line. With points B″ (Fig. 6) as centers, and radius CT, draw arcs above and below points 8. With equal space 5′-6′ (Fig. 3) as radius, and points 8 (Fig. 6) as centers, cut the arcs CT, and mark the points 9.

(h) Draw a right angle. From Fig. 3 transfer line B to the vertical leg and fall distance U to the horizontal leg. The hypotenuse line BU is the developed line. With points B″ (Fig. 6) as centers, and radius BU, draw arcs above and below points 9. With equal space 5′-6′ (Fig. 3) as radius, and points 9 (Fig. 6) as centers, cut the arcs BU, and mark the points 10.

(j) Line A and fall distance V are transferred from Fig. 3 to the vertical and horizontal legs of a right angle. The hypotenuse line AV is the developed line. With points B″ (Fig. 6) as centers, and radius AV, draw arcs above and below points 10. With equal space 5′-6′ (Fig. 3) as radius, and points 10 (Fig. 6) as centers, cut the arcs AV and mark the points 11.

(k) With line length A (Fig. 3) as radius, and points 11 (Fig. 6) as centers, draw arcs above and below points B″. With line V (Fig. 4) as radius, and points B″ as centers, cut the arcs A, and mark both points P′.

**To Lay Out the Crotch Pattern, Fig. 7 —**

(a) Draw a horizontal line equal in length to line Y (Fig. 4). Mark the line Y″-Y″.

(b) Draw a right angle. Transfer line F from Fig. 3 to the vertical leg and fall distance X to the horizontal leg. The hypotenuse FX is the developed line. With point Y″ (left side, Fig. 7) as center, and radius FX, draw arcs above and below line Y″-Y″.

(c) Transfer line F and fall distance P from Fig. 3 to the vertical and horizontal lines of a right angle. The hypotenuse FP is the developed line. With point Y″ (right side, Fig. 7) as center, and radius FP, cut the arcs FX and mark the points 13.

(d) The line G and the fall distance N′ are transferred from Fig. 3 to the vertical and horizontal legs of a right angle. The hypotenuse GN′ is the developed line. With point Y″ (left side) as center, and radius GN′, draw arcs above and below line Y″-Y″. With equal space 5′-6′ (Fig. 3) as radius, and points 13 (Fig. 7) as center, cut the arcs GN′, and mark the points 12.

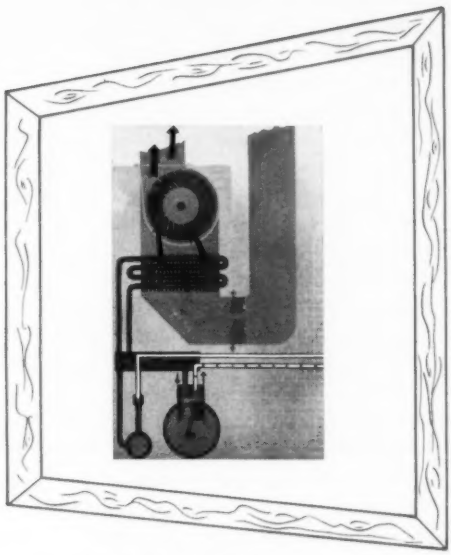
(e) Transfer line H and fall distance M′ from Fig. 3 to the vertical and horizontal legs of a right angle. The hypotenuse HM′ is the developed line. With point Y″ (Fig. 7, left side) as center, and radius HM′, draw arcs above and below line Y″-Y″. With equal space 5′-6′ (Fig. 3) as radius, and points 12 (Fig. 7) as centers, cut the arcs HM′, and mark the points 11.

(f) From Fig. 3, transfer line G and fall distance N to the vertical and horizontal legs of a right angle. The hypotenuse GN is the true length line. With point Y″ (right side, Fig. 7) as center, and radius GN, draw arcs above and below line Y″-Y″. With equal space 5′-6′ (Fig. 3) as radius, and point 13 (Fig. 7) as center, cut the arcs GN, and mark the points 14.

(g) The line H and the fall distance M are transferred from Fig. 3 to the vertical and horizontal legs of a right angle. The hypotenuse HM is the developed line. With point Y″ (right side, Fig. 7) as center, and radius HM, draw arcs above and below line Y″-Y″. With equal space 5′-6′ (Fig. 3) as radius, and point 14 (Fig. 7) as center, cut the arcs HM and mark the points 15.

Through the developed points, draw the outlines of the patterns; add seam and joint allowances, flange allowances, layout holes, and mark the patterns for fabrication.

# Heat Pump — Rising Factor in Cooling Picture



**An analysis of an increasingly important medium for cooling as well as heating is presented to help the dealer provide his customers with the full story of what a heat pump can do**

**By S. W. Reid**
**Air Conditioning Engineer**
**Gilbert Associates, Inc.**

THIS MONTH we shall digress from the practical problems that have been discussed recently in order to look at some of the fundamentals of the heat pump. Many air conditioning dealers seem to regard this device as something only remotely related to the type of product which they normally sell. The feeling prevails, perhaps, because they lack a full understanding of what a heat pump is and how it operates. It is understandable why the layman should find the heat pump's ability either to supply or remove heat rather incomprehensible, but the air conditioning dealer will certainly want to provide his customers with at least the basic story when inquiries come in.

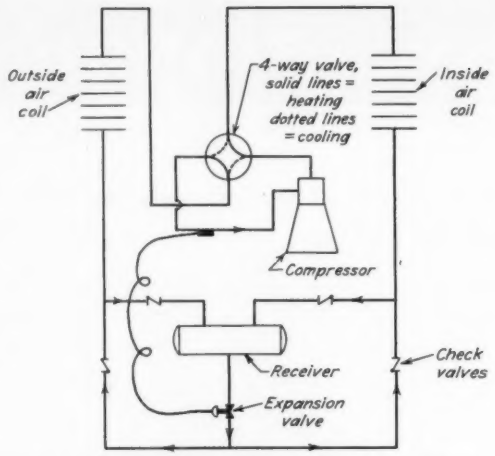
In its strictest sense, the designation *heat pump* is applied to a refrigerating system when it is used in such a manner as to provide heat to a conditioned space. This is in contrast to the more common term *air conditioner* which usually describes such a system when the objective is to remove heat. Anyone familiar with the principles of refrigeration knows that all refrigerating systems absorb heat at one point and give up heat at another. There is no basic distinction, therefore, between a heat pump and an air conditioner so far as the refrigeration cycle is concerned. The classification of a system depends upon the utility of its functions.

### Terminology is Confusing

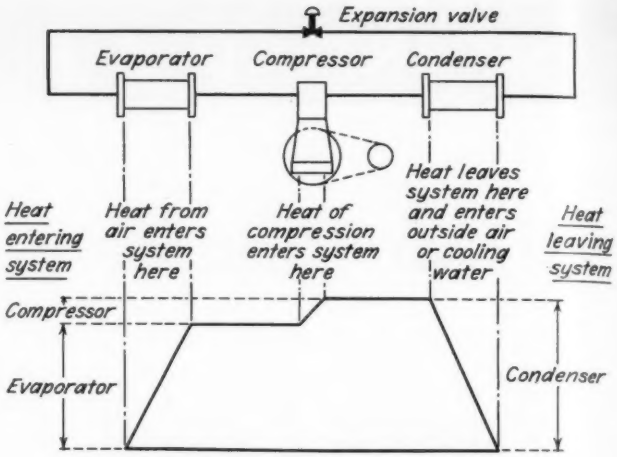
In practice the terminology is slightly confusing since practical means have been found to obtain useful cooling as well as useful heating from the same refrigerating system. The term *reverse cycle* is sometimes inaccurately used to describe such an arrangement, but the industry has generally adopted the title of *heat pump* for this dual functioning system as well as for the system which provides only useful heating. The term *air conditioner* is often reserved for systems which provide useful cooling only.

The familiar room cooler or window unit air conditioner can be used to demonstrate how a refrigerating system is used as a heat pump. This unit has two fans which move air through two coils. Room air moving through one coil is reduced in temperature. Outside air moving through the other coil is raised in temperature. The primary function of the unit is to cool air; therefore it is called an air conditioner. The heating of outdoor air is of no interest except as it is incidentally related to the primary function of the unit.

If the window unit were turned




**1** REFRIGERANT FLOW is altered by means of single four way valve to obtain either heating or cooling from a single refrigeration system




**2** HEAT ENTERING system equals heat leaving system to demonstrate Law of Conservation of Energy. Lower part of diagram represents energy in the form of heat which enters and leaves the system

180 deg on its mounting, warm air would be supplied to the conditioned space, and the very same unit could then be called a heat pump. In this case the cooling of the outside air would be of no interest except as it is related to the primary function of the unit, which in this case is heating.

### Three Types of Heat Pumps

Heat pumps, like air conditioners, can be classified in many ways. There are, for instance, packaged or self contained units which are factory assembled and tested. There are custom made systems built by the installer from specially purchased components. Finally, there are specially designed systems built to meet specific industrial requirements and processes. The residential air conditioning dealer is primarily interested in the first category. Therefore we shall confine this discussion to this type system.

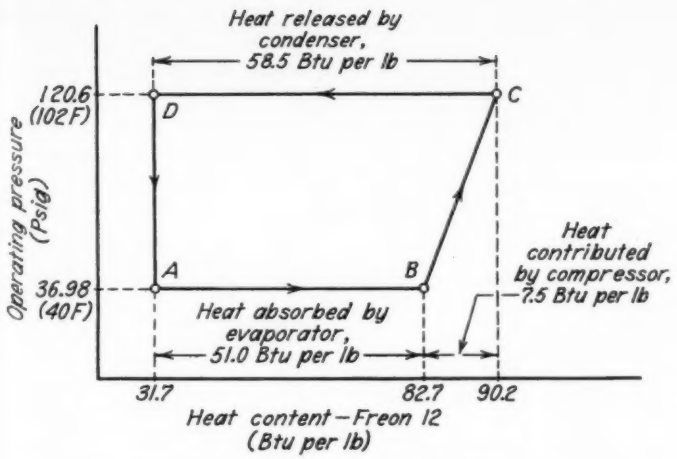
Packaged heat pumps are of the dual function type; that is, they can provide either heated or cooled air from the same refrigerating system. This feature is of particular interest to the home owner who requires cooling as well as heating, since under certain conditions he can satisfy both his needs with substantially the same equipment he would need for cooling alone. Unfortunately, the heat pump has certain characteristics which can result in economic limitations to its universal application in residences. With the proper combination of climatic conditions and cooling and heating loads, however, it is gradually assuming a respected position on the list of equipment which is commercially available for controlling the climate in a house.

The packaged heat pump with which we are concerned is available in several different arrangements which are designated as air-to-air, water-to-air and water-to-water. The first word in these descriptions identifies the heat source and the third word signifies the medium to which heat is delivered. Again using the window type room cooler to illustrate, if the unit were used as previously described (warming inside air and cooling outside air) it would be called an air-to-air heat pump since the refrigerating system is absorbing heat from outdoor air and delivering heat to indoor air. If a shell and tube heat exchanger were substituted for the outside air coil, the former could be supplied with water and the unit would be called a water-to-air heat pump. If a second shell and tube heat exchanger were substituted for the inside air coil the unit would be a water-to-water heat pump since heat would be absorbed from one water circuit and delivered to a second independent water circuit.

### Classification by Changeover

Heat pumps may be further classified in accordance with the two methods used for changing over from the cooling function to the heating function and vice versa. In one method the refrigerant flow is altered; in the other the flow of the heated and cooled media is altered. The window unit again serves to illustrate. As normally installed the unit cools indoor air and heats outdoor air. If the refrigerant flow were altered, the indoor coil could conceivably supply heat whereas the outdoor coil could absorb heat. On the other hand, if the refrigerant flow were left as normally arranged for cooling indoor air, it would be possible by means of ducts to arrange for the outdoor coil to heat the conditioned space and for the indoor coil to cool the outdoor air. This, in effect, is what is done by rotating the unit 180 deg on its mounting as was suggested previously.

Because of the cumbersome duct arrangement necessary to alter air flow, changeover in an air-to-air heat pump is usually accomplished by altering refrigerant flow. This ob-




**3** BASIC REFRIGERANT CYCLE traces a pound of refrigerant through the system. Theoretical coefficient of performance is 58.5/7.5, or 7.8

**A SPECIAL SERIES**

**. . . of articles pertinent to the residential air conditioning dealer is based on the author's wide experience in the field. The discussions began with consideration of the fundamentals and operating characteristics of residential cooling units, then turned to specific problems, service and installation techniques. Earlier articles have treated such contemporary subjects as types and characteristics of refrigerants, lubrication, charging and trouble shooting procedures, managerial problems, installation techniques, modernization and zoning.**

**CONTINUING THE APPROACH**

**. . . we will investigate more of the cooling dealer's problems, analyzing subjects such as installation and servicing of cooling towers, liquid and suction line sizing, blower operation in summer and winter, eight different combinations for heating and cooling units and cooling problems in an old eight story house.**

viously applies also to water-to-air heat pumps. Changeover in water-to-water heat pumps is usually accomplished most simply by altering the flow of water.

### Use of Four Way Valves

A common method for changing over from summer to winter operation is illustrated by the flow diagram in Fig. 1. The diagram shows how a single four way valve in the refrigerant tubing is used to interchange the flow of refrigerant from the inside air coil to its outside air counterpart and vice versa. On the heating cycle, for instance, the compressor pumps hot vapor to the inside air coil where it gives up heat to air passing over the coil and condenses. The refrigerant, now in liquid form, flows next to the receiver and through the expansion valve to the outside air coil where it absorbs heat from air passing over the coil and changes back to vapor form for its return to the compressor. The flow during the cooling cycle is shown by the dotted lines on the four way valve.

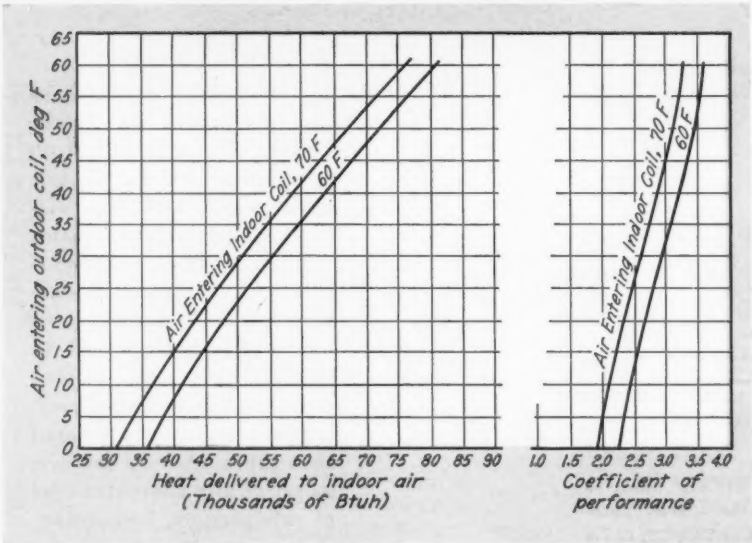
### Conservation of Energy Defined

Let us now review some of the fundamental thermodynamics of the refrigeration cycle to see where the heat pump gets its heat. The upper diagram in Fig. 2 shows the various elements which make up a refrigeration system. The lower diagram represents energy in the form of heat which enters and leaves the system. In accordance with the fundamental physical *Law of the Conservation of Energy*, the sum of all forms of energy put into the system must equal the sum of all forms of energy leaving the system after it has assumed steady operation. Thus, energy in the form of heat which is absorbed by the evaporator from the air plus the heat equivalent of the electrical energy needed to drive the compressor must equal the heat which leaves the system through the condenser.

Fig. 3 is a more specific presentation of the same facts brought out in a general way by the lower diagram in Fig. 2. To understand Fig. 3 it is necessary to imagine we are observing 1 lb of a common type of refrigerant as it circulates around a system through the evaporator, compressor, condenser and expansion valve. Our first glimpse of the refrigerant is at point *A* as it enters the evaporator in liquid form with a heat content of 31.7 Btu per lb. As it changes to the condition represented by point *B* the pound of refrigerant absorbs heat from air in the amount of 51.0 Btu. The compressor carries the refrigerant to point *C* and during compression adds heat at the rate of 7.5 Btu per lb. The condenser receives refrigerant with its maximum heat content and cools it to its minimum heat content thereby releasing 58.5 Btu from each pound passing through. When it leaves the condenser in condition *D*, the refrigerant passes through the expansion valve which reduces its pressure to complete the cycle.

### Heat Output vs Energy Input

The importance of Fig. 3 from the standpoint of heat pump operation




**4** CAPACITY AND COEFFICIENT of performance of actual commercial heat pump. Note: Coefficient of performance=delivered heat/total unit input in kw × 3413

is the relationship of the heat output of the system to the energy input. Thus, for the conditions shown, the system can deliver 58.5 Btu from the condenser for each 7.5 Btu of compressor energy. The ratio of these two figures is known as the coefficient of performance. For the example, it would be 58.5/7.5, or 7.8.

### Calculating the Coefficient

Unfortunately the coefficient of performance calculated with reference to Fig. 3 takes into consideration only the refrigerant properties. In actual practice the electrical energy required for the assumed conditions would have to be greater than the 7.5 Btu per lb theoretically needed in order to overcome unavoidable losses in the compressor, driving motor and refrigerant tubing. Thus, a practical coefficient of performance for a refrigerating system in accordance with Fig. 3 might be only 4.76 as calculated for a commercial compressor and motor. When the power input to fan or pump motors and other necessary auxiliaries is added to the compressor motor input, the overall coefficient of performance for a heat pump drops even lower. Even so, the heat pump usually can deliver considerably more heat for a given amount of electricity than can be produced by resistance heaters.

Any dealer who is familiar with the operating characteristics of the refrigerating system in an air conditioner knows how variations in the temperature of the medium being cooled by the evaporator and heated by the condenser affect operating pressures in the system. He also knows that the capacity of the system is greatest when the difference between the operating pressures is least. The refrigerating system in a heat pump has the same characteristics, except that in this case we are primarily concerned with capacity in terms of the amount of heat delivered by the condenser. Fig. 4 shows how the heating capacity and coefficient of performance of an actual air-to-air heat pump vary under the influence of the entering air temperatures. The unit is powered by a single phase 5 hp motor. The coefficient is calculated for the total power input to the unit which includes power required by inside and outside air fan motors as well as by the compressor motor.

There are certain disadvantages and limitations in the use of outside air as a source of heat for a heat pump. Fig. 4 shows that the heat output decreases as the outside temperature drops, often resulting in a situation in which the least heat is available when it is needed most. It would, of course, be possible to select a heat pump with sufficient capacity to meet requirements at low outside temperatures, but the cost of such a selection might be prohibitive in view of the short periods of minimum temperatures.

### Consider Cooling Capacity

The selection of a heat pump for residential application practically always requires consideration of the unit's cooling as well as heating capacity. In many cases the heating function is considered secondary to the cooling function. The owner must buy the refrigerating equipment to provide the cooling he wants. If he can obtain additional utility from it by purchasing a heat pump instead of an air conditioner, he may find that the somewhat higher cost of the heat pump is worthwhile.

The selection of a residential heat pump on the basis of its cooling capacity is usually the most economical procedure to follow since it results in the lowest investment in relatively expensive refrigeration components. Any deficiency anticipated in heating capacity during the periods of minimum outdoor temperature can be corrected by low cost electric resistance heaters built into the inside air circuit of the heat pump. The power cost for the operation of these heaters will, of course, be higher than that of the heat pump per Btu. This situation can be tolerated, however, when the application is such that very little auxiliary heat will be needed.

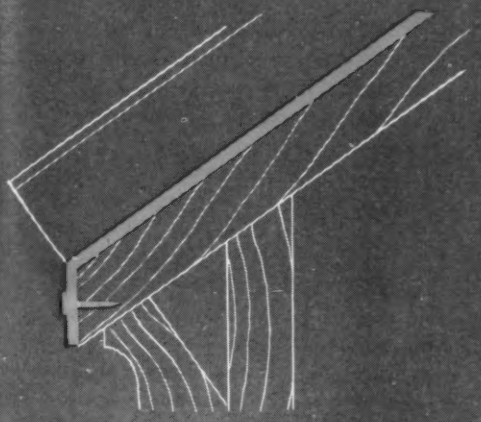
### Climate Influences Selection

Although the preceding discussion has centered primarily on the air-to-air heat pump since it appears to have the broadest utility for residential use particularly in the warmer sections of the country, the water source heat pump should not be ignored. Water offers a good source of

(*Continued on page* 86)

# HOW WOULD YOU DO IT?

## . . . this way?



EDGE STRIP DETAIL
BATTEN SEAM ROOF
Fig 1

In the Fig. 1 detail the roofing pans are turned down over the cornice edge and secured by copper nails spaced about 3 inches on center.

In Fig. 2, along the cornice edge, a continuous edge strip made from 8'-0" long pieces, such as shown, is attached to the roof boarding before the roofing pans are placed. The lower edge of the roofing pans hook over this previously placed edge strip.

In Fig. 1 the exposed nails will work loose and draw out so they can be removed by the fingers. By nailing the sheets, expansion and contraction movement is restricted. This causes waves and buckles to form in the roofing sheets.

## . . . or this way?

EDGE STRIP DETAIL
BATTEN SEAM ROOF
Fig 2

In Fig. 2, where the roofing pans are hooked over the edge strip, freedom of movement is provided for the necessary contraction and expansion of the metal. This also keeps the copper nails from being exposed, for a neater installation. A proper drip edge is also provided and the cornice edge of the roof can be finished in a workmanlike manner. Note that the edge strip should extend under the copper roofing pans at least 4" and the ends of each 8'-0" length butt together.

**We do not wish to presume to tell you how to install gutters, leaders, roofs, flashing, coping covers, etc., because there are many methods which you no doubt have found to be satisfactory. The purpose of this advertisement is to point out the methods of installation that have been proved by many years of use, and backed by more than a century and a half of experience in working with copper, to be the most satisfactory techniques. You will find these methods in Revere's 110 page brochure, "COPPER AND COMMON SENSE." Send for a copy today. And remember: Revere has a staff of specialists known as Technical Advisors, whose experience qualifies them to render valuable service and advice regarding the use of metals in the building field. Feel free to consult with them at all times regarding the use of Revere Copper; you incur no obligation. Revere Technical Advisors may be contacted through the Revere Office nearest you.**

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# Heat Pump Becomes Factor in Cooling

(*Continued from page 84*)

low grade heat because it usually does not have the temperature range over a season that air has. Outdoor air may vary from below zero F to 60 F in the winter, whereas water might vary only from 40 F to 60 F. Actually, it is not practical to consider using water much below 45 F because of the possibility of freezing in the evaporator as it is chilled.

For residences which have an ample supply of well water and an adequate arrangement for disposing of it, the water source heat pump has a better chance of meeting maximum heat requirements than has an air source heat pump. The reason, of course, is that the capacity of the former will not fall off with a decline in outside temperature.

### Earth Used As Heat Source

Although air and water are the common heat sources, investigators have used the earth itself by burying coils in the ground. Some tests along these lines have shown possibilities, but so far they also show several limitations, not the least of which are the area required and the cost of the piping system.

In addition to the research into possible heat sources, studies are being made of the possibilities of storing heat during off-peak operation and using it to make up peak load capacity deficiencies. Heat storage is accomplished by heating a large quantity of stored water or by supplying the heat of fusion to certain chemicals. The chemical method can store the same amount of heat as water in about one quarter the volume.

### Use Care in Calculating Loads

The marketing of packaged heat pumps has necessitated very careful reevaluation of heat loss calculation methods. Many tests have been made to determine how closely actual heating requirements match conventionally calculated loads. The results have demonstrated a fact which has been known for some time about cooling loads; that there are many factors not normally considered which lessen the severity of the heating load in a residence just as they also have a tendency to level off peak cooling needs.

In terms of equipment cost, the Btu produced by the heat pump are higher than the Btu produced by other conventional heating equipment. It is much more important, therefore, that the heating load estimate be as representative of actual conditions as possible. When a heat pump application is being considered, the dealer should always follow the recommendations of the manufacturer in calculating both loads.

### Study the Economics

The economics of using a heat pump as compared to other conventional methods for obtaining heat is a broad subject in itself and always makes an interesting study. Honest comparisons should always be made. The coefficient of performance, for example, must be defined so that the dealer knows whether just the compressor input or the input to all motors is included. By the same token, total energy requirements for a conventional system and not the fuel cost alone must be considered. Maintenance costs should be estimated for each type of system since they may vary considerably between the two. For new construction, cost savings such as elimination of the chimney can enter the picture. One factor which should be considered with regard to any economic study is human nature. People do not buy for economic reasons alone. If they did, we should all still be riding in horse-drawn wagons.

In view of the increasing recognition of the heat pump as a cooling medium, dealers will do well to give the idea some study.

# Blot Out the Low Bidder with Customer Prudence

In American Artisan for May we told about one of the ways that the Johnson Sheet Metal Works of East Moline, Ill. develops sales leads through the mailing of four page folders describing the type of work performed by this company. Since we published this article, Charles Johnson has sent us another one of his mailing pieces in which he is endeavoring to pave the way for his salesmen to upgrade each sale.

The mailing piece is a 3¼ × 6¼ in. attractively designed blotter that bears this sage advice:

"It's unwise to pay too much, but it's worse to pay too little. When you pay too much, you lose a little money—that is all. When you pay too little, you sometimes lose everything, because the thing you bought was incapable of doing the thing it was bought to do. The common law of business balance prohibits paying a little and getting a lot — it can't be done. If you deal with the lowest bidder, it is well to add something for the risk you run. And if you do that, you will have enough to pay for something better."

The blotter is included with general mailings from the Johnson Co. offices but is unsigned. Mr. Johnson says that he feels it's the message that counts more than who sends it. Mr. Johnson, of course, will benefit — as will everybody else in the industry — when the public has become so well educated on the subject that the too-low bidder has become a thing of the past. Mailings such as these are certainly a step in the right direction.

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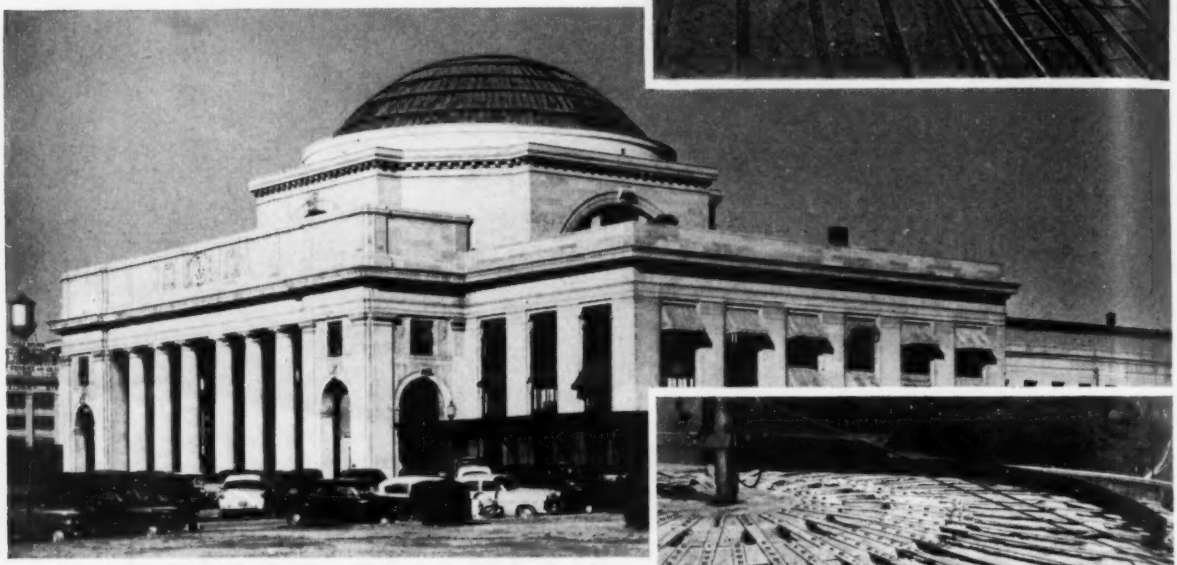
# Re-roofing a dome with copper

**ROOFING PANS** preformed from 20" x 96" x 20 oz. gage cold rolled copper sheets were used for the batten seam construction.

**COMPLETED COPPER-COVERED DOME** which is 94' 6" in diameter and 28' high. Architect: Carneal & Johnston. General Contractor: James Fox & Sons, Inc. Sheet Metal Contractor: N. W. Martin & Brothers. Anaconda Distributor: Gordon Metal Company. All are located in Richmond, Va.



**NETWORK OF COPPER ALLOY BARS** and angles suspended from the crown help to hold in place the additional structural surfacing required to form the new contour. Angles 3" x 5" bent to the radius and curvature of the dome produced the desired shadow lines.

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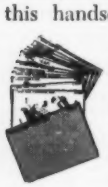
Only this time-tested material could economically match the durability of this handsome building, for copper measures its economy by *generations* of service. It requires little attention or maintenance. And, as it grows older, a copper roof acquires a beautiful green patina.

### Construction details

Placing a new copper covering over a concrete spherical surface called for special designs which dictated that the major portion of the copper roof be of batten seam construction using cold rolled copper sheets of 20 oz. gage, 20" x 96". Inverted bronze channels were employed for the battens. For the crown of the dome, flat lock seam construction was employed using 16" x 18" roofing squares of 20 oz. gage cold rolled copper. Edges were pretinned to a depth of 1½".

When roofing must *last*, ANACONDA Sheet Copper costs *less*. Good design and proper application insure its enduring service. Anaconda building engineers were privileged to assist with the design of this important roofing job. Their counsel is equally available to you in all problems involving sheet copper design and construction. 5487



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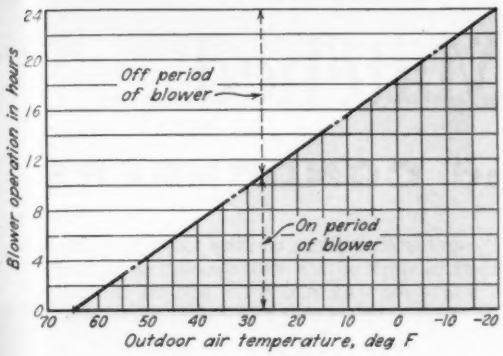
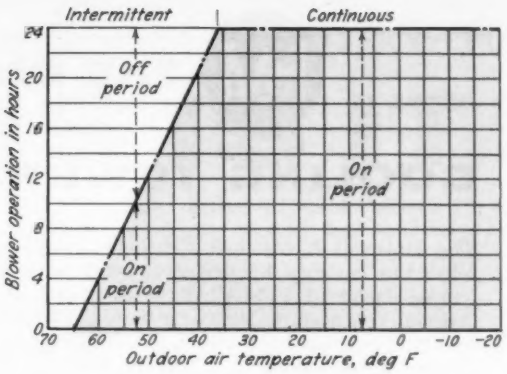



**1** INTERMITTENT BLOWER operation is obtained with high setting of fan switch




**2** USING THE CAC principle gives an approach to continuous blower operation

## *Performance Index Determines*

# Standards for Blower Operation

**By S. Konzo and H. D. Bareither**
**University of Illinois**

**In previous issues . . .**

**. . . we have considered some proposed standards for building construction as they affect the heating dealer. With this discussion, our attention is directed away from the building and to the furnace and blower. The authors propose an arbitrary set of standards for determining whether the blower speed and fan switch settings are properly adjusted for most desirable operation.**

IN THE design of a duct system for a forced air heating installation the method given in the manuals of the National Warm Air Heating and Air Conditioning Association assumes that the bonnet air temperature will be 165 F and the return air temperature to the blower will be 65 F. That is, the temperature rise of the air passing over the furnace is considered to be 100 F.

### Blower Operates Intermittently

In the early days of the development of forced air heating, and to some extent even now, heating dealers frequently adjusted the settings of the fan switch so that the blower would turn on when the bonnet air temperature rose to 165 F. This adjustment was vindicated by the contractor on the basis that the design value was 165 F and so also should be the setting value. At first glance this sounded most reasonable. Unfortunately, adjustment of the fan switch as high as 165 F meant the blower would operate intermittently throughout the heating season, even when the outdoor air temperature dropped to design value (see Fig. 1).

Theoretically, the blower should operate continuously when the outdoor temperature is at design value; in practice this was found not to be the case. The regain

(*Continued on page* 93)

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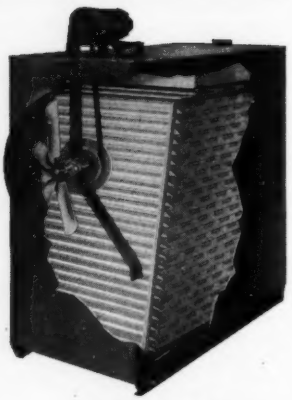
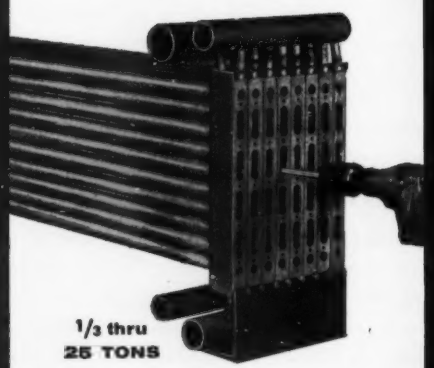


**2 thru 120 TONS**



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TURN OF COUPLER BAND ENGAGES TONGUE IN GROOVE — PIPES SECURELY LOCKED TOGETHER

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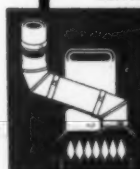

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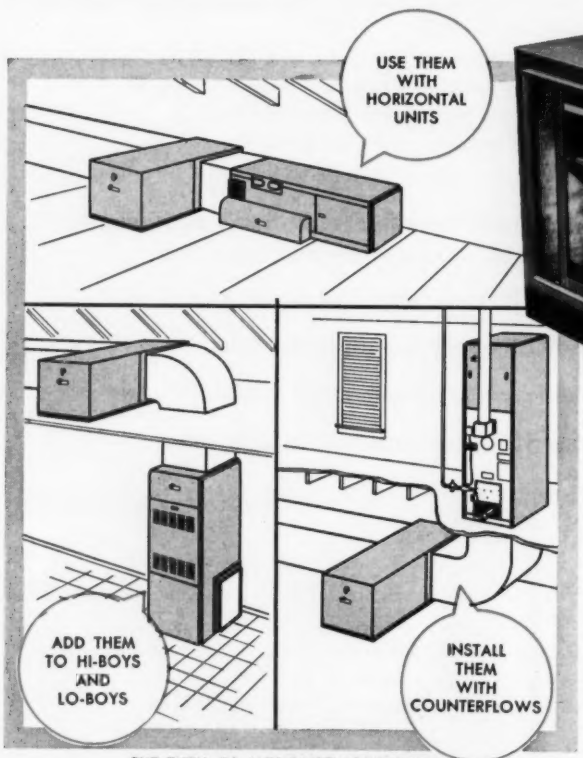


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# Performance Index Rates Blower Efficiency

(*Continued from page* 89)

of heat from the furnace casing, ducts, smokestack and chimney was sufficient to allow intermittent operation of the blower even when the heating demand was at maximum value. With the type of setting shown for Fig. 1 operation, the system was essentially a gravity-booster heating installation; that is, a gravity warm air system with an occasional burst of mechanically circulated hot air.

### Cool Air Discharged Into Rooms

Heating results obtained with a gravity-booster system were not satisfactory. When the blower was not operating even with a reasonably high bonnet air temperature, the branch ducts to second floor rooms and to nearby first floor rooms were supplying heated air by gravity action. When the blower started to run, the flow of air was merely increased, and the ducts never cooled. The air flow to rooms remote from the furnace, particularly those on the first floor, was not continuous but became dormant when the blower stopped. In fact, in some cases where the gravity action to second floor runs was quite strong, some of the warm air ducts reversed the direction of flow and served as return air ducts. In such cases the air in the duct was rapidly cooled to room air temperature. At the next blower cycle when warm air was again pushed through the branch duct, all the cool air in the duct was discharged into the room. This method of operation gave rise to a number of complaints, among which were the following:

a) In some rooms the temperatures were too variable. When the blower operated, the room was warm, but when the blower stopped room temperatures dropped sharply. Also, at the start of blower operation, cool air was discharged from the registers.

b) In some rooms which were farthest from the furnace, conditions were more acceptable in cold weather than in mild weather, especially when the blower operated for longer periods of time.

c) Furnace casings were hot, the basement area near the furnace was overheated, and fuel economy was poor. The *on* and *off* operation of the blower did not result in low electrical consumption because the starting current was exceedingly large.

### Improper Methods Produce 'Cold 70'

In the early days of forced air heating when most heating dealers' experience had been almost entirely with gravity warm air furnaces, attempts to improve the operating performance of forced air systems were frequently based on methods which had been successful in improving gravity warm air installations. In poorly installed gravity warm air plants, certain leader ducts could be made to operate if the bonnet air temperature were increased to a high value. Sometimes a sluggish leader duct would work only in cold weather when the heat input to the furnace was increased. When similar techniques were applied to ailing forced air systems, the results were most disappointing. For example, if the setting of the fan switch were raised from 165 F to 200 F, as was done in many jobs, the furnace often became overheated, the galvanizing on the smoke stack began to peel, the basement areas near the furnace became too warm, the blower operated in short, pulsating jerks and the room temperature control was not improved. Another corrective measure was to increase the blower speed, regardless of whether the temperature rise through the furnace was 100 F or less. In many cases an increase in blower speed only caused shorter operations of the blower and further aggravations of unbalanced temperature conditions. These complaints were frequent, and were given the derogatory label *cold* 70. Since the complaints came at a time when gas furnaces were making inroads into the coal furnace market, the *cold* 70 condition was blamed on gas fuel. No basis exists for this accusation. Cold 70 can be obtained with any fuel if the settings of the controls and the adjustments of the blower speed are not properly made.

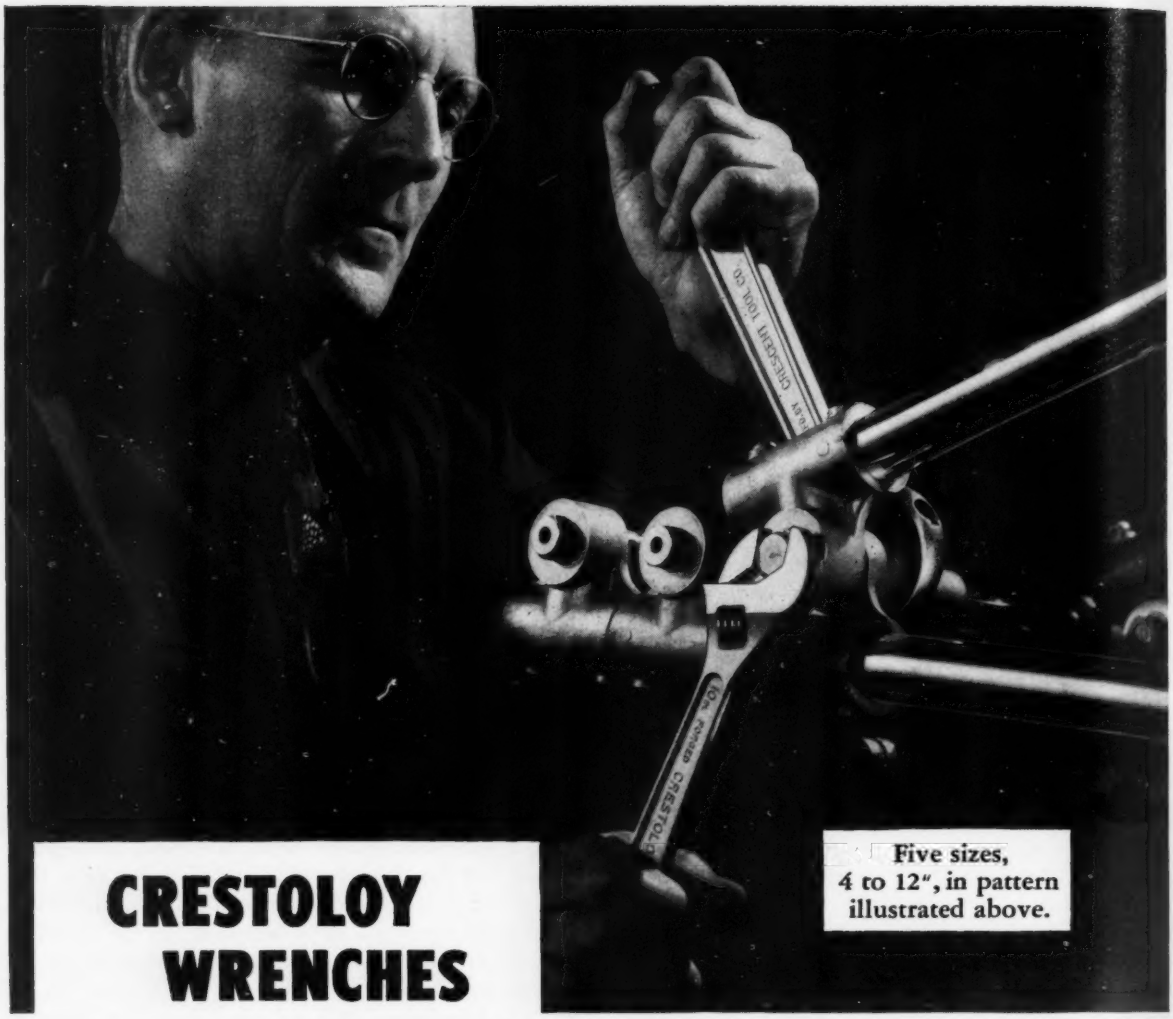
### CAC Methods Applied

The CAC or Continuous Air Circulation principle has been explained so often that there is little need to

(*Continued on page* 96)

### A NEW APPROACH

**. . . to modern heating and cooling techniques upon which future improvements in heating systems should be based is presented through complete analysis of the known factors and practices now observed by progressive warm air heating dealers. The authors propose to show how the information now on hand can be developed to provide equipment and installation techniques superior to present practices. Some of the subjects yet to be covered are adjustment of fuel input and combustion efficiency, venting of flue gases, noise, temperature control and distribution, temperature differentials and drafts.**

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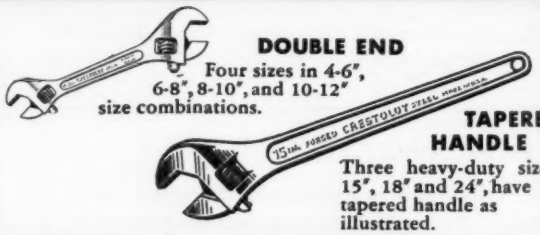

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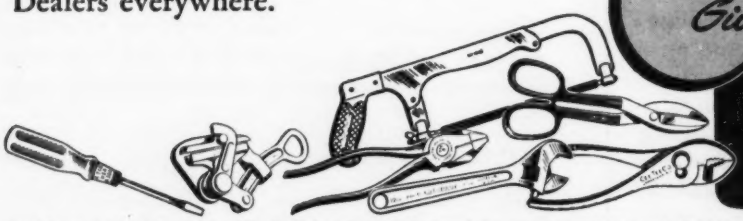

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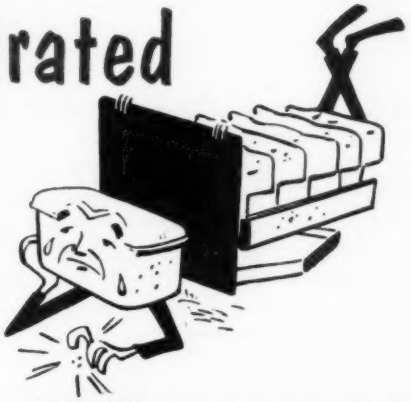

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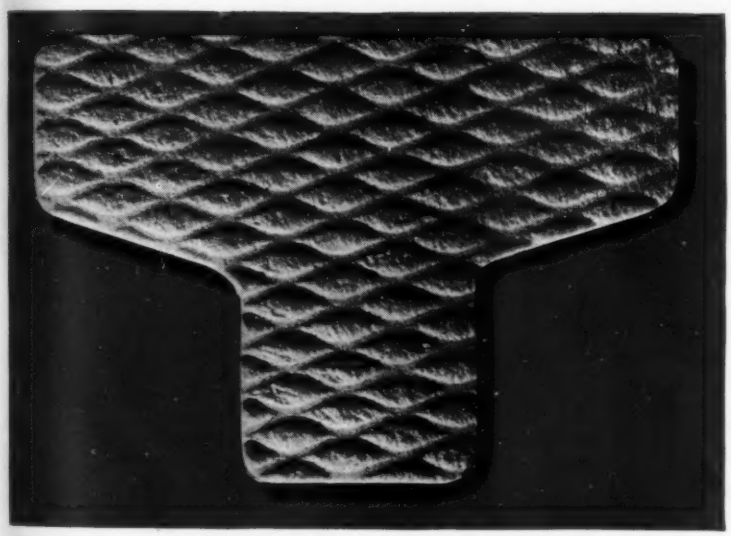

No humidifier can be any better than its plates—because the plates are the only elements that can do any humidifying. The rest of the device exists merely for supporting the plates and supplying them with water. Any humidifier is thwarted of its life purpose unless it has good plates.

## BEST PLATES — A MUST

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| Type Plate | Dry Weight Ounces | Wet Weight Ounces | Gain Dry to Wet* | Open Space In Plate# |
|---|---|---|---|---|
| Patented Vapoglas | 1.5 | 3.6 | 140% | 83% |
| Plate B | 3.4 | 4.6 | 38% | 55% |
| Plate C | 1.67 | 2.61 | 54% | 42% |
| Plate D | 9 | 11.5 | 28% | 27% |

Drop test on concrete floor shows Vapoglas has greatest resistance to breakage.
*Indicates water absorption.
#Indicates resistance to clogging with water chemicals.

6973

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MILFORD, MICHIGAN

# How to Rate Blower Performance in the Field

(*Continued from page* 93)

spell out each detail. Briefly, the principle consists of the following corrective measures:

a) Adjustment of burner input to the lowest value that will handle the requirements.

b) Adjustment of blower speed to give a temperature rise of 100 F through the furnace.

c) Adjustment of the fan switch to provide for blower operation when bonnet air temperature reaches about 110 F, and for blower cutout when bonnet air temperature drops to about 85 F.

d) Adjustment of room thermostat differential to a low value, about 1 deg or less.

e) Adjustment of the limit switch to a value not in excess of 200 F, and preferably not over 175 F.

### Rate the Plant on the Job

So far we have considered only theory and design. We shall now consider the measurements that can be made in the field by the heating dealer. We shall attempt to give the contractor information which will show whether he has a well adjusted or a poorly adjusted plant as far as CAC principles are concerned:

If the percentage of time the blower is operating on any given day can be determined, it is possible to plot the data on a simple curve and determine if CAC operation is being obtained. The steps in the process are as follows:

a) Select a time of day when the furnace and blower are operating regularly and on cycle. Avoid those periods after changes in thermostat setting, of intense sun load, of large cooking loads, and other heavy load periods. Usually a night period during moderately cool weather is preferable to the daytime for this observation. The outdoor air temperature for this short test period should be noted.

b) By means of a pocket watch, observe and jot down the times when the blower starts and stops. This time check should be made for at least two cycles of blower operation.

c) Determine the total time of blower operation and the total time of the *off* period. From these values the percentage of the total time that the blower was operating can be calculated.

d) Plot the point on Fig. 3.

e) If the plotted point falls in region A, the fan switch setting needs no change. If the point falls in region B, a slight reduction in fan switch setting is probably desirable. If the point falls in regions C or D, the CAC adjustments should be made.

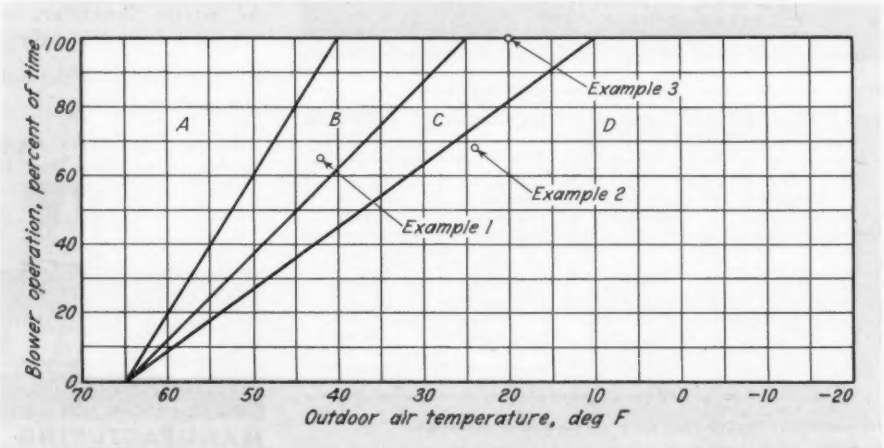
### Data Curve Determines Adjustment

The data for these two examples is plotted on Fig. 3. The point for Example 1 falls in region B, so only a slight adjustment in blower speed or fan switch setting might be required to make the system conform to CAC principles. In Example 2, however, the point falls in region D and more extensive measures may be needed to make the system conform to CAC principles.

The following details concerning the proposed method merit the heating dealer's consideration:

a) The use of a watch can be replaced by employing a recording chart which will record the periods when the blower is *on* or *off*. Operations recorders suitable for use by a heating contractor are produced by industrial instrument manufacturers. The recorder is con-

(*Continued on page* 100)




**3** CLASSIFICATION CHART for blower operation shows separation of regions A, B, C, D

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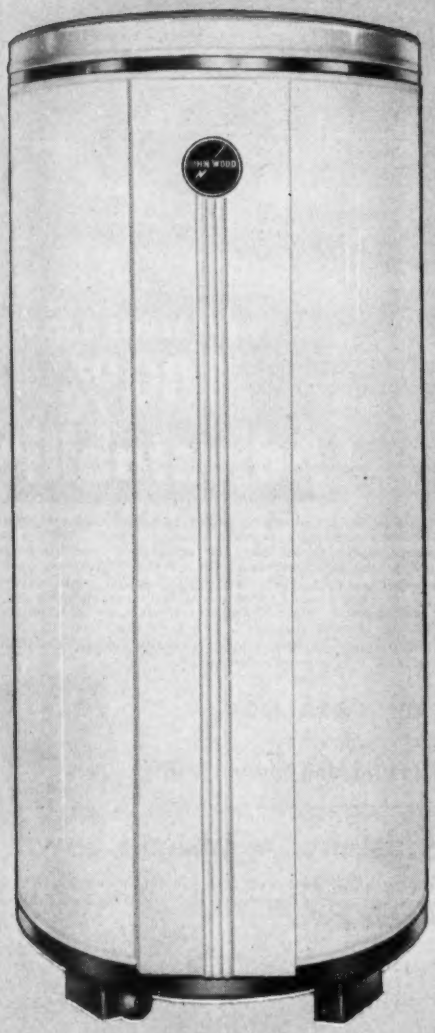

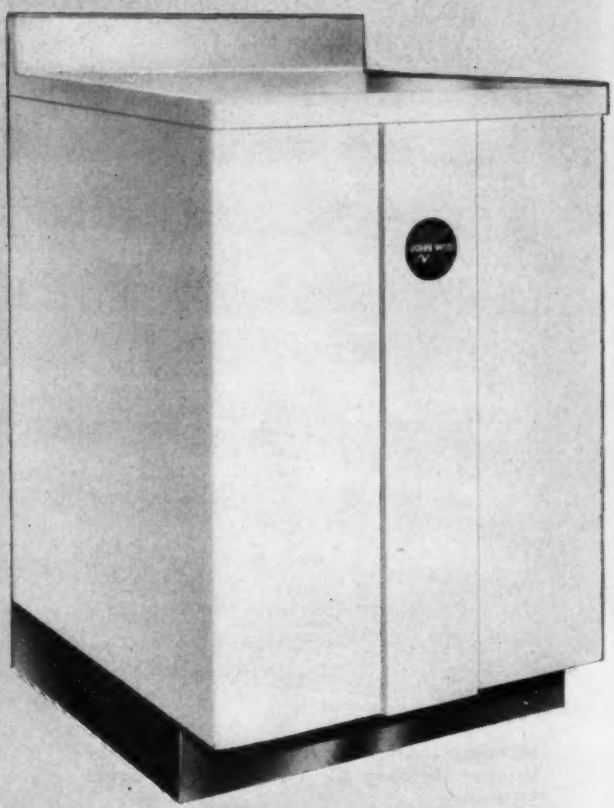

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*Stocks maintained in Richmond, Va.; Birmingham, Ala.; and Los Angeles, Calif.*

# Rating Blower Operation Eliminates Trouble Jobs

(*Continued from page 96*)

## Actual Field Measurements of Blower Operation

**Example 1**

| | hr:min:sec | On time | Off time |
|---|---|---|---|
| Blower on | 8:26:10 | — | — |
| Blower off | 8:35:15 | 9:05 | — |
| Blower on | 8:40:10 | — | 4:55 |
| Blower off | 8:50:35 | 10:25 | — |
| Blower on | 8:56:05 | — | 5:30 |
| Sub-totals | | 19:30 | 10:25 |
| Total time | | 29:55 | |

Blower operation as percent of total time ..... 65 percent

Outdoor air temperature ..... 42 F

**Example 2**

| | hr:min:sec | On time | Off time |
|---|---|---|---|
| Blower on | 8:05:40 | — | — |
| Blower off | 8:21:20 | 15:40 | — |
| Blower on | 8:28:25 | — | 7:05 |
| Blower off | 8:43:40 | 15:15 | — |
| Blower on | 8:51:00 | — | 7:20 |
| Sub-totals | | 30:55 | 14:25 |
| Total time | | 45:20 | |

Blower operation as percent of total time ..... 68 percent

Outdoor air temperature ..... 24 F

nected into the electrical circuit of the blower, across the terminals of the blower motor. For determining the time of blower operation, a period should be selected when the blower is cycling regularly. With a recording chart it is possible to select a larger number of cycles and thereby achieve a better representation of the blower operation.

b) Occasionally the dealer may attempt to secure data when the weather is so cold that the blower never stops when he is on the premises. For example, suppose at an outdoor air temperature of 20 F the blower is operating continuously (see the point of Example 3 on Fig. 3). The plotted point falls in region C; the operation is apparently far from ideal. However, it should be recognized that this blower could be operating continuously when the outdoor air temperature is 25 F, 30 F, or even higher. The trouble is that we have no means of telling what will happen until the weather is milder. The only sure way of determining whether the blower would operate intermittently would be to return on a milder day to secure more data.

c) The lines separating the four regions in Fig. 3 all converge towards 65 F outdoor air temperature rather than towards 70 F because the furnace plant ordinarily stops operating when the outdoor air temperature rises to 65 F.

d) For an extremely mild climate, such as that in which the outdoor design temperature is only +30 F, the line that separates regions A and B might be moved further to the left. In general, however, unless a later revision is made necessary by changing standards of comfort, the authors propose the four regions shown.

e) If any change in setting or adjustment is made in the furnace, blower, or controls after an initial set of time readings has been made, then a completely new set of time data should be secured. In other words, any adjustment in the plant will be reflected as a change in the blower cycle.

This simple tool for evaluating the blower performance can be effectively utilized by a heating dealer and will enable him to make a more shrewd analysis of trouble jobs.

The next article will continue the discussion of heating standards.

# Use W H A M to Locate New Business

Operation WHAM — a program whereby warm air heating and residential air conditioning dealers of a community join in a concentrated local advertising campaign designed to promote the sale of heating and cooling equipment — is underway for its second season, according to Randall Nelson, director of public relations, National Warm Air Heating and Air Conditioning Association. Operation WHAM takes its name from *Warm air Heating and Air conditioning Modernization.*

The objective of operation WHAM is to help the industry open up the modernization market for its dealers, according to Mr. Nelson who says, "The effect will be to lessen price competition and bolster each dealer's economic position." Details of the program can be obtained from the offices of NWAHACA at 640 Engineers Bldg., Cleveland 14, Ohio.

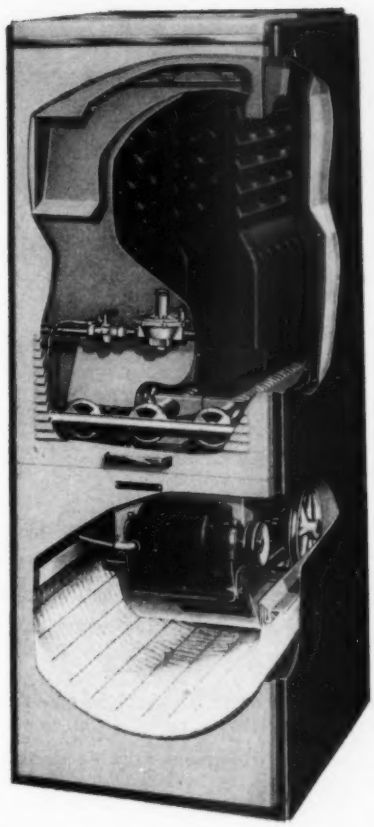
**More features to talk about, of course, but it's the dealer policy that makes**

# LENNOX®

# *the* NO. 1 NAME IN WARM AIR HEATING

Point-for-point . . . Lennox gives you more selling features. Steel heat exchangers with "silent seal" cabinet anchoring; whisper-quiet, floating blowers; exclusive hammock filters; Mellow-Warmth controls; beautiful, baked enamel cabinets are just a few of the reasons it pays to sell the No. 1 line. This dealer policy helps make YOUR name No. 1 locally:

- **Finest, most complete sales and service training program . . . teaches your men the latest techniques to increase your sales volume.**
- **Proven new-business development ideas . . . real, two-fisted selling tools . . . to get extra heating and air conditioning sales.**
- **Special tailor-made promotion kit to help *your* builders sell their houses (a Lennox exclusive).**
- **Nationwide branch office engineering service — heating and air conditioning technicians at your disposal — anywhere, anytime.**
- **Largest consistent advertising program . . . tells your prospects about your products and services.**
- **The finest products in the industry . . . the most complete line to sell.**
- **A product warranty that *assures* customer satisfaction.**

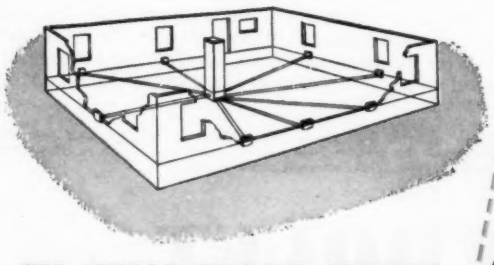


**IN WARM AIR HEATING, MORE FAMILIES BUY LENNOX THAN ANY OTHER MAKE**

*Over 100 models, gas, oil, coal . . . Air conditioning, too!*

*Perima-flo*® **ANOTHER PROFIT OPPORTUNITY**

**Here's draft-free perimeter heating . . . perfected! A real sales story to tell . . . for extra profit.**



**THE LENNOX FURNACE COMPANY**

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***In Canada:* Toronto and Calgary**

CLIP TO YOUR LETTERHEAD
MAIL TODAY!
THE LENNOX FURNACE COMPANY
(Address your nearest branch. See locations listed at left.)
All right — send me information on how the Lennox Dealer Policy can help me make more money.
No obligation on my part.

COMPANY NAME _____
ADDRESS _____
CITY _____ STATE _____
MY NAME _____

# Most Modern Pickup You Can Buy!

**Nimble like you want. Rugged like you need. Thrifty like no other. And it's got styling that's so distinctively different that it becomes a profitable advertisement - on - wheels, just parked or on the go.**

**New High-Voltage Engines.** Chevrolet's new Task-Force engines are all sparked by a new 12-volt electrical system.

And what a difference this big double punch makes! You'll notice it the first time you turn the key. For now you get those sure, quick, economical starts—even on the coldest days. Next, you'll feel the big new wallop of action you get in every mile you go. Chevrolet's high-voltage power goes to work the instant your foot gives the command to the throttle!

You'll agree there's nothing like it, especially when you see how much on-the-go economy there is in these new Task-Force engines. For when you put High-Voltage and High-Compression together, as Chevrolet does this year, you've got the savingest engines in the stop-and-go field. And with Chevrolet's Truck Hydra-Matic*, you get a still bigger money's-worth in time saved.

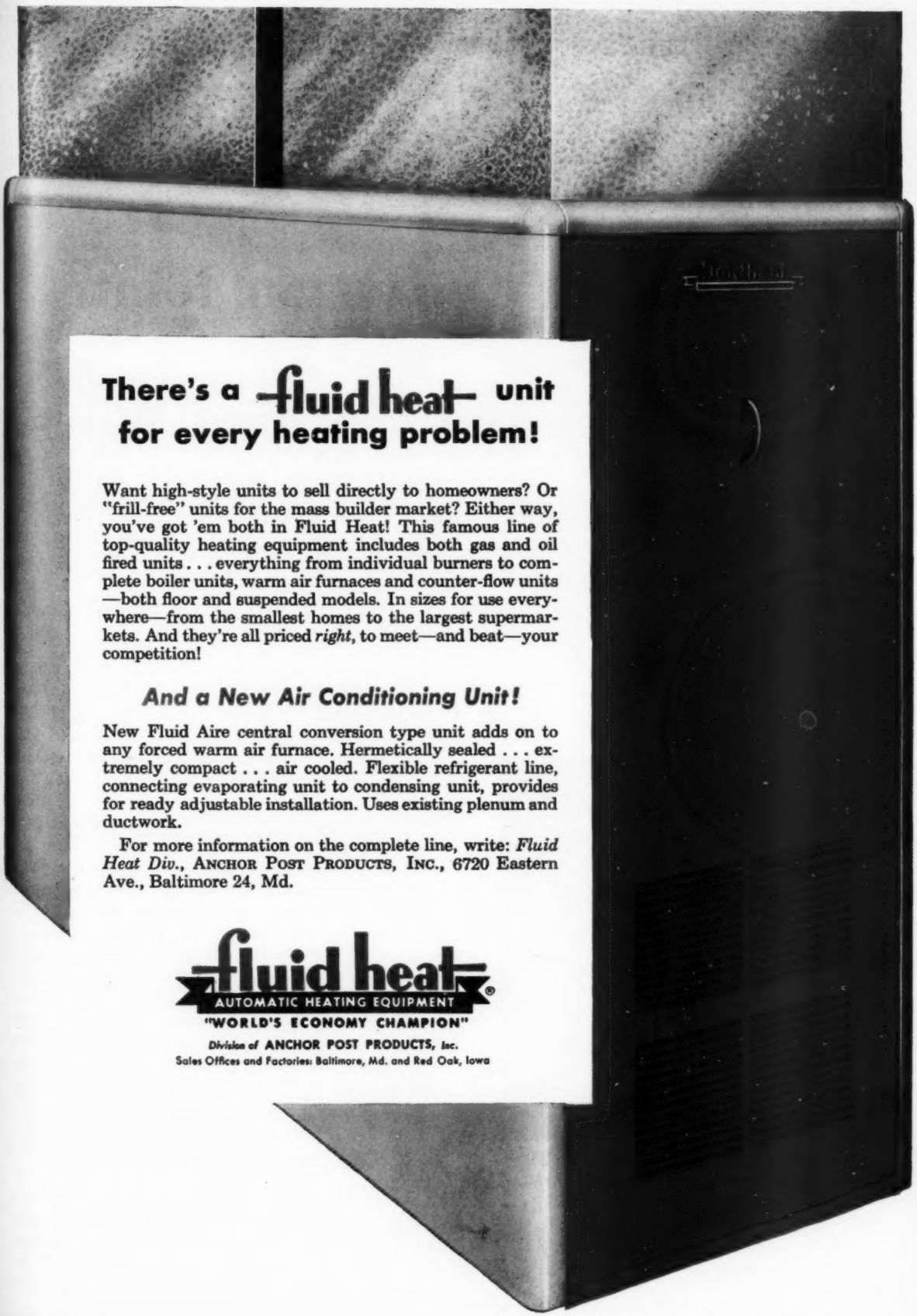
**On and on—completely new.** Talk about a smoother load-steady ride—here it is! For with Chevrolet's new front and rear suspension systems, driver and load have it far easier under all driving conditions.

Frames are new, more rigid, with ladder-type construction and full-length parallel side members. There's new High-Level ventilation for better air circulation in all kinds of weather; new linkage-type Power Steering* for added driving ease and safety; new Power Brakes* that stop with up to one-third less pedal pressure, and do it right now!

**Don't stop here.** The rest of the "all-new" story is equally great. So see your Chevrolet dealer. Be sure to ask about his trade-in deal too. Makes good listening for buying today.... Chevrolet Division of General Motors, Detroit 2, Michigan.

**Optional at extra cost. Truck Hydra-Matic on ½-, ¾-, and 1-ton models. Power Brakes standard on 2-ton models, optional on all others. Power Steering available on all except Forward-Control models.*

# NEW CHEVROLET CHEVROLET *Task-Force* TRUCKS



# There's a fluid heat unit for every heating problem!

Want high-style units to sell directly to homeowners? Or "frill-free" units for the mass builder market? Either way, you've got 'em both in Fluid Heat! This famous line of top-quality heating equipment includes both gas and oil fired units . . . everything from individual burners to complete boiler units, warm air furnaces and counter-flow units —both floor and suspended models. In sizes for use everywhere—from the smallest homes to the largest supermarkets. And they're all priced *right*, to meet—and beat—your competition!

## *And a New Air Conditioning Unit!*

New Fluid Aire central conversion type unit adds on to any forced warm air furnace. Hermetically sealed . . . extremely compact . . . air cooled. Flexible refrigerant line, connecting evaporating unit to condensing unit, provides for ready adjustable installation. Uses existing plenum and ductwork.

For more information on the complete line, write: *Fluid Heat Div.*, ANCHOR POST PRODUCTS, INC., 6720 Eastern Ave., Baltimore 24, Md.

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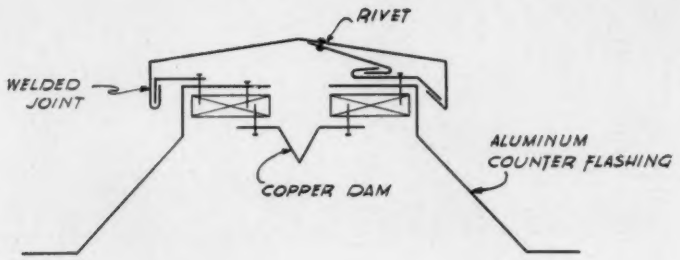
AUTOMATIC HEATING EQUIPMENT
"WORLD'S ECONOMY CHAMPION"
*Division of* ANCHOR POST PRODUCTS, *Inc.*
Sales Offices and Factories: Baltimore, Md. and Red Oak, Iowa

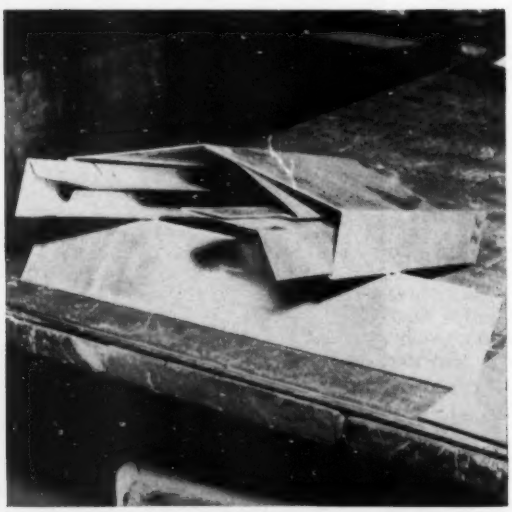



**1** COMPONENTS OF aluminum expansion joint combine to provide effective sealing of roof parapet flashing

# Aluminum Expansion Joint

# Solves Trim and Flashing Woes

**Inherent problems of contraction and expansion in sheet metal are corrected to provide attractive and functional applications in a modern building**



**2** ASSEMBLED SECTIONS of the expansion joint form the complete assembly, ready to install

IN THE FACE OF an adage that proclaims there is nothing new under the sun, members of the sheet metal industry are forever being called upon to devise a way of overcoming new problems created by construction procedures being followed in the building field. One such problem recently solved by The Riester & Thesmacher Co., Cleveland sheet metal contractors, was development of an aluminum expansion joint to seal the roof parapet flashing for the new Cleveland airport terminal building. Details of the expansion joint are shown in Fig. 1. Wooden rails were laid upon the concrete and brick parapets. Between the rails a copper dam in the form of a winged vee was placed to catch any condensation that might occur during different seasons. The counter flashing for the roof was made of aluminum — to meet the architect's specifications — and runs from under the felt and paper roof covering to the top of the nearest parapet rail, where it is fastened with aluminum nails. The expansion joint cover starts with a modified type C end joint on which the two edges of the seam are welded. (The heli-arc method of welding was used throughout.)

### Strip Permits Movement Without Exposure

The second edge of the cover is held in place by a partial type C end joint which uses an overlapping seam on its inner edge. This seam is paired with a locking strip which has been riveted to the right side of the cover sheet. The advantage of this locking strip is that it

(*Continued on page* 108)

# ROYAL JET BRINGS NEW BTU'S* TO HOME HEATING

*BUDGET TAILORED UNITS

HONEYWELL "ROUND" THERMOSTAT OR GENERAL CONTROL "THIN" THERMOSTAT
BLOWER SPEED CONTROL
COMBINATION FAN LIMIT CONTROL
ROYAL JET GLASS ELEMENT
HONEYWELL CHRONOTHERM OR GENERAL TEMPOTHERM
DIAPHRAGM GAS VALVE
SOLENOID AUTOMATIC VALVE

## THE FORCED AIR FURNACE OF THE FUTURE...TODAY

Royal Jet performs new home heating magic!
A NEW FORCED AIR FURNACE... A NEW WAY TO SELL! Royal Jet eliminates the major obstacle of furnace selling with *Budget Tailored Units. Now you can sell a "Tailor Made" forced air furnace.
A furnace tailored to the particular requirements of any job... whatever the size of the home... whatever the price range. You control your bids by specifying precisely the extra features the builder or owner prefers. Every extra feature, or accessory, is listed with its price to allow you to accurately calculate costs. Now you can tailor a Royal Jet furnace to every builder's heating budget. Royal Jet *Budget Tailored Units offer you the advantage of complete flexibility in the planning and selling of home Heating.
Royal Jet *BTU's... the modern... efficient way to sell.

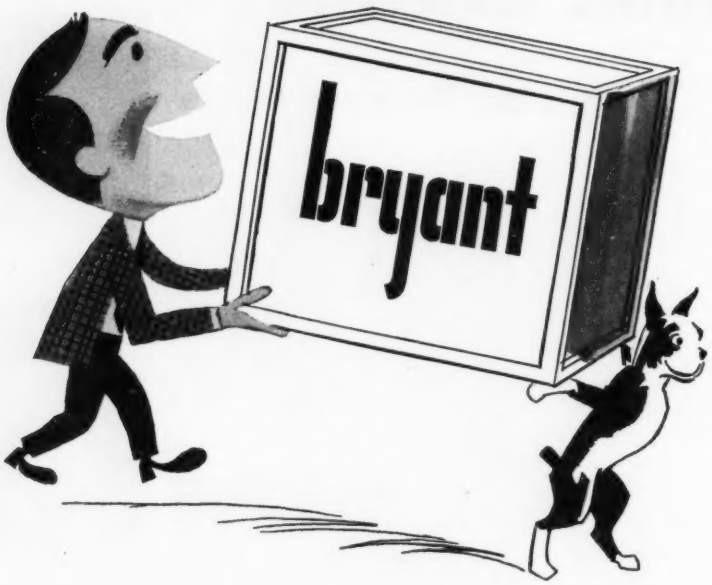
The new Royal Jet Forced Air Gas Furnace is an outstanding achievement in craftsmanship. It combines ultra-modern design with advanced engineering techniques to offer you many new advantages. Quieter fully automatic performance... simplified maintenance... economical efficiency. Lightweight compactness is the keynote of the Royal Jet. The RFA 80... 58¼" high x 14³⁄₁₆" wide x 25³⁄₁₆" deep... can be installed in a standard 30" closet faster, easier, more economically. For the rated size of the furnace, the Royal Jet requires an absolute minimum of floor space. Now available are Upflow models ranging from 75,000 to 150,000 BTU input and Counterflow models ranging from 75,000 to 110,000 BTU input. All models may be ordered as De Luxe Budget Tailored Units or as super quality Custom Units.

For complete information contact your local heating dealer or phone Royal Jet • ATlantic 9-4239

Royal Jet
1024 WESTMINSTER AVE. ALHAMBRA, CALIF.

**all furnaces approved by the American Gas Association**

## Profit by exceptional distributor service!




Your **BRYANT** Distributor is nearby and ready with engineering, sales and service help—to help you sell and install **BRYANT** units *profitably*.

# be "Mr. B"

(AUTHORIZED BRYANT HOME COMFORT DEALER)

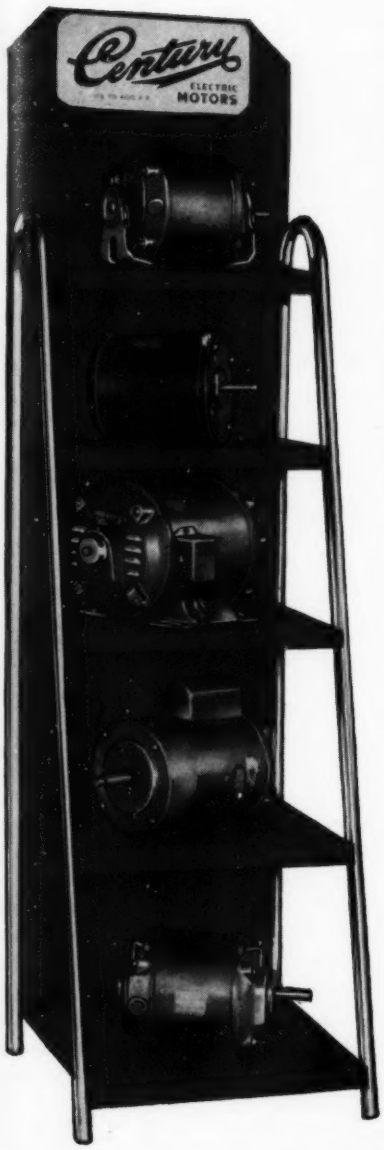
Only "Mr. B"—the Bryant Home Comfort Dealer—has *all 8* of these selling assets to build his business BIG:

1. A name customers know and want
2. The most complete line of automatic heating, air conditioning, water heating
3. Quality equipment for every market
4. Exceptional distributor service
5. Professional sales training
6. Personalized selling tools for you
7. National advertising featuring you
8. Co-op "Mr. B" ads for local papers

For bigger profits now, for a secure and prosperous future—see your Bryant Distributor. Ask him about Bryant's big "Mr. B" action program, and how it can make sales and money for you!

**bryant**®

AUTOMATIC HEATING
AIR CONDITIONING
WATER HEATING

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Think how many of your jobs need new motors. You can cash in on this natural selling opportunity when you stock and sell Century Performance-Rated replacement motors. Century's complete range of size, speed, frame, mounting and torque characteristics helps you give every job precisely the right replacement motor for top performance.

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This handsome, sturdy display stand puts you in the motor business immediately ... and it requires only a few square feet of floor space. Find out how you can get it FREE with your first assortment of Century Performance-Rated motors

GET FULL DETAILS on this opportunity...

Performance-Rated®
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*Offices and Stock Points in Principal Cities*

**MAIL THIS COUPON TODAY!**

**CENTURY ELECTRIC COMPANY, 1806 Pine St., St. Louis 3, Missouri**

Send me all the facts about Century's Display Stand Motor Selling Plan:

*Name*.....

*Company*.....

*Address*.....

*City*..... *State*.....

# Aluminum Meets Trim and Flashing Demands

(*Continued from page* 104)

**3** LASTING WELD of intersecting expansion joint was accomplished by heli-arc welders

**4** ALUMINUM IS USED for roof flashing and window frame trim to complete the design motif

**5** CURTAIN WALL panels of aluminum provide attractive decorations for airport observation tower

permits the freedom of movement needed for the expansion joint without exposing it to the conditions normally encountered in attempting to keep moisture migration at a minimum. Fig. 2 shows the details of the actual expansion joint which was fabricated in 10 ft lengths. Fig. 3 illustrates how two intersecting expansion joints were joined.

### Expansion Joints Compensate for Motion

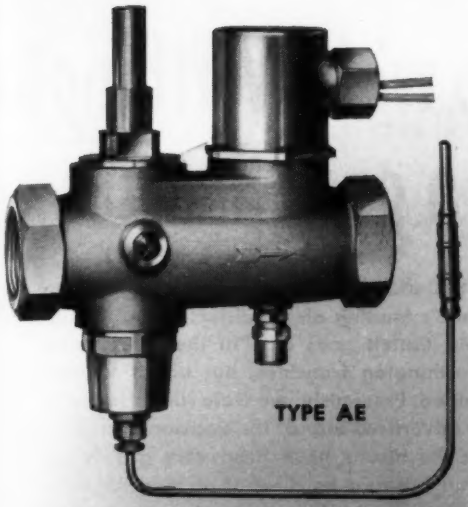
The five story terminal building is capped with a two story aircraft control tower. Much of the trim for this structure is fabricated from lightweight aluminum. Besides the roof flashing shown in Fig. 4, aluminum trim is used on frames of the many windows throughout the building. When aluminum is to be used architecturally as in this application, provision for expansion and contraction has to be made. The coefficient of expansion for aluminum sheet is 0.0000132 per deg per lineal inch. This rate of expansion is about twice that of ferrous metals, but only slightly greater than that of copper. Thus, a 30 ft aluminum flashing strip that is exposed to a 135 F temperature range would expand approximately 9/16 in. Consequently, expansion joints must be placed at intervals along the flashing.

### Treated Metal Requires Little Maintenance

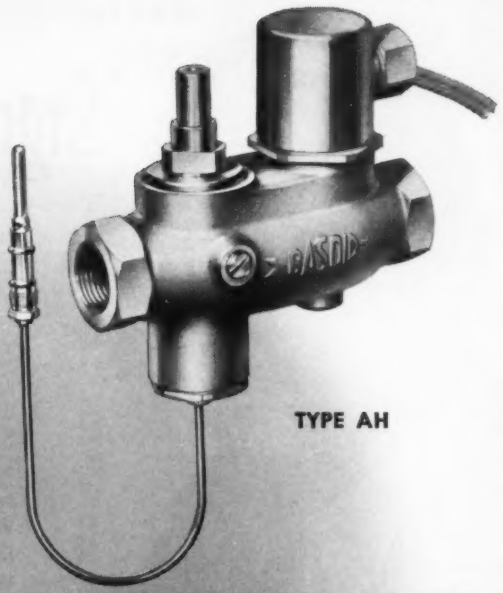
The same problem of expansion and contraction must be considered when aluminum is used for trim on a building of this type, especially where it is fastened to structural steel or other dissimilar metals commonly used for wall and window frame supports. Where this situation exists, it is usually recommended that a heavy coat of alkali resistant, bituminous paint be applied to the opposing surfaces. A coat of zinc chromate primer made with a synthetic resin is also used on such applications. To further reduce the effect of electrolysis, each piece of trim and flashing used on the Cleveland terminal was given an aluminizing treatment, which also tends to resist the acids found in the atmosphere of most cities where there are many varied industries. The trim and flashing installed on this building are expected to require a minimum of maintenance.

The effectiveness of this type of treatment of aluminum for architectural use is shown by the appearance of the aluminum trim and curtain wall panels installed on one of the wing observation towers (Fig. 5) completed over a year ago. There was no evidence of corrosion or deterioration at any of the joints inspected.

The building also contains approximately 3000 ft of sheet aluminum coping, 3500 ft of gravels stop and fascia and 1500 ft of large girth fascia, all fabricated and installed by The Riester & Thesmacher Co.

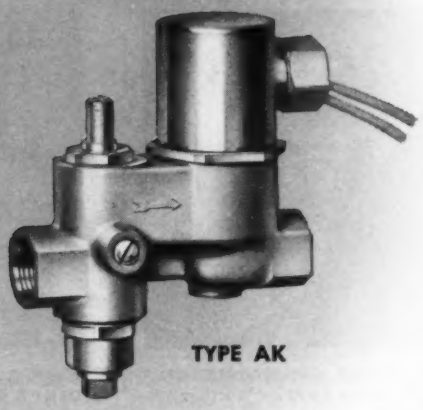


TYPE AE



TYPE AH

# A FULL RANGE OF BASOID® VALVES



TYPE AK

Since we last talked Basoid valves with you, two sizes have been added—1″ and ⅜″ pipe sizes—to give a full selection range for your appliances that require automatic main gas control plus an automatic pilot with complete gas shut-off.

The same features of solenoid valve and automatic pilot in one casting are common to all Basoid valves. Construction materials and basic design are the same in all sizes. Stainless steel plungers, aluminum shading rings, aluminum bodies, and other corrosion-resistant materials enable these valves to laugh at all gases, even those with high sulphur content.

Each size can be supplied with two pilot tappings, with one tapping, or with none, as you see fit. You can have a pressure tapping below the solenoid or a manual control screw in the same place.

Voltages: 20 v., a.c.; 113 v., a.c.; 230 v., a.c.; and 440 v., a.c.

**HOW'S THIS FOR A LINE UP?**

| Type | Size | Capacity Btu/hr. @ 1″ Pressure Drop | | |
|---|---|---|---|---|
| | | Mfd. Gas | Nat. Gas | LP Gas |
| AE4511 | 1″ | 283,000 | 419,000 | 889,000 |
| AE4411 | ¾″ | 230,000 | 340,500 | 723,000 |
| AH4411 | ¾″ | 145,000 | 214,600 | 455,000 |
| AK4311 | ½″ | 107,000 | 158,360 | 336,000 |
| AK4211 | ⅜″ | 87,000 | 170,000 | 273,200 |

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MILWAUKEE GAS SPECIALTY CO.

**Dept. AA-6**

**MILWAUKEE 1, WISCONSIN**

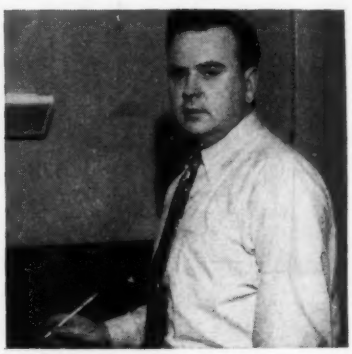
WORTHINGTON DEALERS ARE SUCCESSFUL DEALERS!

# "Signing up with Worthington was a good move"

**. . . says Richard H. Catlett, President of the Catlett-Johnson Corporation, Virginia's leading air conditioning and refrigeration dealers. Mr. Catlett goes on: "In the eight years we've had the Worthington franchise, our dollar volume has more than doubled. Previously, we were identified with another nationally advertised brand. The decision to change was not easy, but the results have been very gratifying. We've expanded our business as a result of Worthington's unrestricted franchise and complete range of products. And Worthington is one outfit that *never* competes with its dealers."**

**RALPH E. ORCUTT, CATLETT-JOHNSON'S SALES MANAGER SAYS:** "Worthington promotion material is second to none — it helps us do a bang-up job. I'm enthusiastic about the way the Worthington people — and the sales aids they create — help us locate prospects . . . and turn them into sales. Worthington's staff of merchandising experts have given us a big hand in the development of a sound dealer program. And Worthington's national reputation helps a lot."

**JOHN C. HILDEBRAND, JR., VICE PRESIDENT & CHIEF ENGINEER, SAYS:** "The fact that I can rely on Worthington's published engineering data and ratings saves me many hours of engineering time. And Worthington's complete line of equipment allows me to select the units I know will be best for the job. Reciprocating and central station systems, year-round residential units, packaged air conditioners, add-ons—Worthington's got *everything!*"



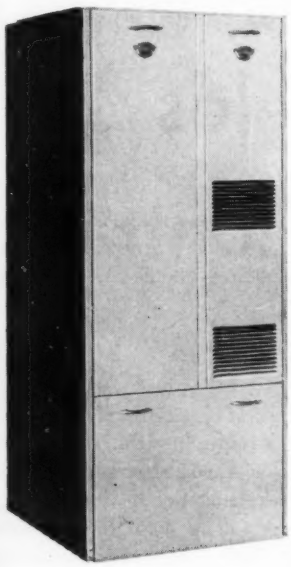
**J. TABB MEYER, JR., OPERATIONS MANAGER, SAYS:** "Worthington units are extremely compact, well-designed, and easy to install almost anywhere. You can see the equipment is built with the serviceman in mind — easy accessibility cuts down our maintenance and service time. And Worthington's million-dollar compressor just can't be beat for day-in, day-out reliability. On the off-chance that something may go wrong, Worthington's five-year warranty takes care of it."

Catlett-Johnson's story — like so many others we've received — adds up to this: Worthington dealers are *successful* dealers. And there are plenty more reasons why. Lots of them are mentioned in Worthington's new monthly publication, "The Merchandiser". Write for it today. Worthington Corporation, Air Conditioning and Refrigeration Division, Section A.5.37-A, Harrison, N.J. A.5.37-A

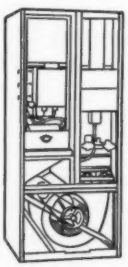
**WORTHINGTON**

**THE BEST FRANCHISE . . . THE MOST COMPLETE LINE**

# smooth operator with floating chassis



*compact design saves floor space. floating chassis eliminates cabinet vibration.*



## UTILITY'S NEW COMBO-365 AIR CONDITIONER

More and more home owners are demanding a single unit air conditioner —one that cools and heats—that is compact, quiet and fully automatic. That's why Utility designed and engineered the new Combo-365. Here's year-round climate control . . . 365 days of push-button comfort.

With floor space at a premium, Utility concentrated on saving space. The two-ton/75,000 BTU model measures only 27½" wide, 27½" deep—about a third less than comparable capacity conditioners. The three-ton/105,000 BTU model is proportionately compact.

To guarantee quiet operation, Utility designed the "Floating Chassis" refrigeration circuit installed on resilient channels to eliminate cabinet vibration. This unique interior design also permits installing first the cabinet including the forced air furnace . . . easily adding the hermetically sealed refrigeration chassis whenever the home owner desires. Maximum airflow is assured by the large 12" double width blower which is resiliently mounted for quiet operation. Utility's Sy-Lent* heat exchanger silences expansion and contraction noises.

Of course, Combo-365 boasts automatic controls. What could be simpler than a flip of a thermostat switch. That's all you need to change from summer to winter operation. No dampers to install. No change-over worries.

Combo-365 is an exciting new addition to modern living. For increased efficiency, trouble free operation and complete customer satisfaction, Combo-365 is a stand-out performer.

**Patent applied for*

See the complete Utility heating and air conditioning line now.

**GAFFERS & SATTLER AND OCCIDENTAL**
Automatic Gas Ranges
**UTILITY**
Furnaces • Air Coolers
Air Conditioners
Water Heaters

a happier living family tree . . . all branches of UTILITY

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Please send me full information on:

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- ☐ Utility Cooling Equipment
- ☐ Utility Automatic Gas Water Heaters

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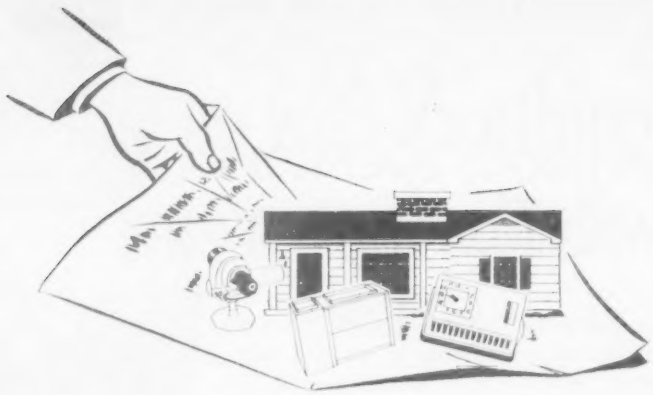
ADDRESS_____

CITY_____ ZONE___ STATE_____



# Wrap Up Air Conditioning Sales with a Package Mortgage Contract

**Warm air heating dealers should find an eager market among builders who recognize the value of offering air conditioning which can be paid for along with the home — at the same interest rates and longer term**

**By William Hurd Hillyer**

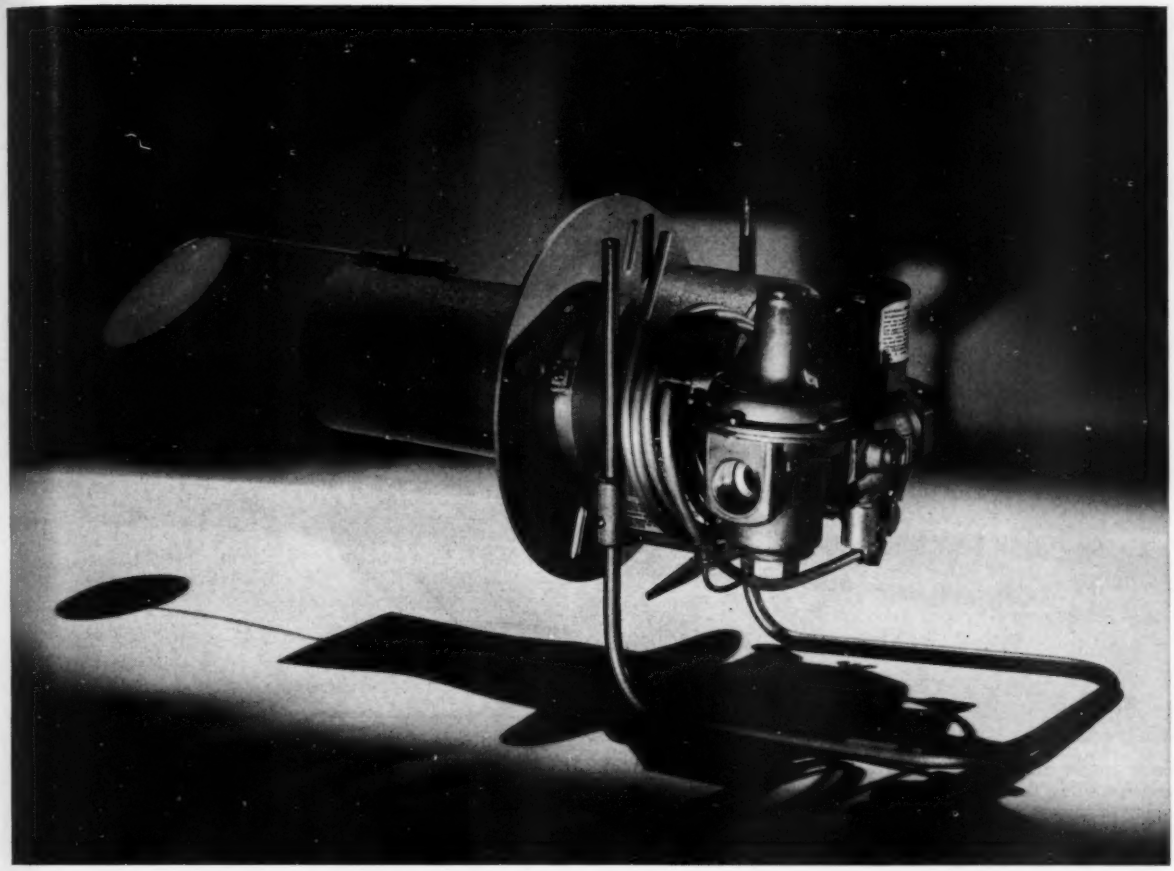
ADVENT OF the so-called *package* mortgage has initiated a new era in the entire equipment field, say qualified observers. Like the *open end* mortgage described last month, its name is self explanatory. Its function is to wrap up into one package, along with the real estate, such items as air conditioning and other installations as well as various appliances that by common custom are bought separate from the real estate.

The net result of package mortgaging is to bring all these extras under one inclusive lien. Each payment on the mortgage includes a payment on the installed equipment.

In other words, the owner covers everything in only one set of payments. In addition he gets the benefit of the longer terms and lower interest rate afforded by the general mortgage, to say nothing of the smaller single installment as compared with the ordinary separate buying method.

The package mortgage, though not widely publicized, has been used with satisfactory results by leading lenders in New York and elsewhere for sufficient time to prove its worth. This financing method is singularly useful in connection with housing developments. With its aid, the buyer enjoys the use of the installed equipment on extremely easy terms from the moment he occupies the premises. Such a feature makes the housing units more salable. The warm air heating dealer who puts on an effective campaign emphasizing this point to

(*Continued on page* 116)



## This Quality Burner costs you less than any comparable model

Lowest-priced burner in the field . . . easiest to install . . . practically no service calls . . . that's what our dealers are saying about the new Barber GUN-HEAT gas conversion burners.

Look at the GUN-HEAT model shown above. It's the popular SNG 1-A designed for converting oil-fired boilers and furnaces to gas. AGA tested and listed from 65,000 to 185,000 BTUH on natural and mixed gases. Other models are available up to 350,000 BTUH.

Because we know that repeated service calls can gobble up dealer's profits, Barber engineers have wrapped up 35 years of burner know-how in the GUN-HEAT to make it trouble-free in operation and easy to install correctly.

The SNG 1-A, for example, has no moving parts. The venturi is super-strong pressed steel and the blast tube is seamless welded.

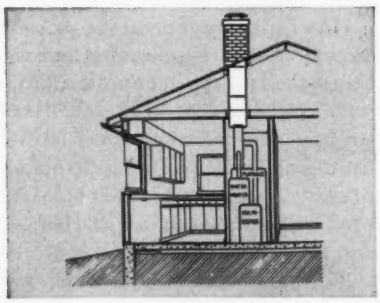
How can quality burners be priced so low? Briefly, because this burner is designed for specific applications, we have been able to standardize on parts and substitute steel fabrications and steel stampings in place of costly castings. The result is mass production methods for Barber — and lower costs for you.

*Write for specifications and prices on the GUN-HEAT to the address below.*

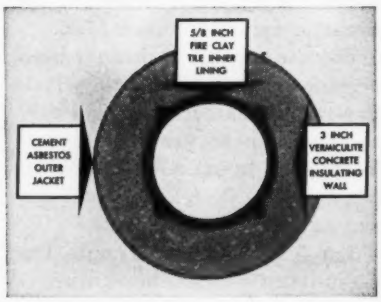
THE Barber MANUFACTURING COMPANY
GAS AND OIL BURNER DIVISION
3704 Superior Avenue, Cleveland 14, Ohio • HE 1-6045

**Earn more dollars profit** on each heating job by selling and installing the *entire* heating system — furnace *and* masonry chimney. You can do it easily with Van-Packer, the factory-engineered, completely packaged, lifetime masonry chimney. You make a high *clear* profit on each chimney you sell — simply install it, take your profit, forget it. No service call-backs on the Van-Packer Packaged Masonry Chimney. It's the only masonry chimney tested and listed by UL for coal, oil or gas for all home heating plants and incinerators, and is approved by major building codes. You can easily install the Van-Packer Chimney in 3 hours or less, anytime after house is framed in, even after house has been completed. Immediate delivery to job through your local heating supply jobber.

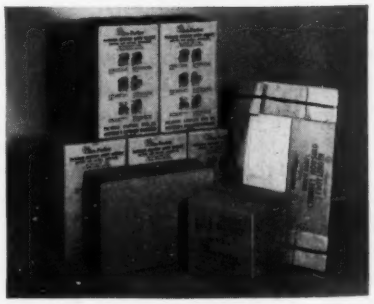
# Profit on the entire heating system — sell the furnace and Van-Packer Chimney



**34% greater draft** with the Van-Packer, compared to 8" x 12" brick chimney, plus almost twice the venting capacity — your furnace operates more efficiently. Ceiling suspended Van-Packer Chimney installs directly over furnace.




**Safe, permanent masonry** materials go into the Van-Packer Chimney. Tile liner withstands 2100° F. 7" ID Van-Packer can be used wherever 8" x 12" brick chimney is specified, saves your customers 20-40% over brick.



**Easy-to-handle cartons,** clearly marked. All parts needed for 10 ft. Van-Packer Chimney shown above. See "Chimneys" in your classified telephone directory for your Van-Packer Jobber, or write Van-Packer Corp.

**Van-Packer PACKAGED MASONRY Chimney**

**For detailed facts on Van-Packer Chimneys, send for Bulletin 11-RS-1 today.**

Van-Packer Corporation • Bettendorf, Iowa • Phone DAvenport 5-2621

"I've never seen a sheet take every bend and roll without the coating flaking—but SOFTITE did it!"

"Fastening collars on straight boots is real severe. No sheet has ever been able to take it—but SOFTITE did it!"

"At last a sheet that can take a Pittsburgh Lock without chipping or flaking—and SOFTITE did it!"

"We've never had a sheet that combined a ductile base with a really tight zinc coating, but SOFTITE did it!"

*actual details furnished upon request.*

they* all said
it couldn't be done . . . but

# WHEELING SOFTITE®

galvanized sheets
did it!

Ever since Wheeling SOFTITE Cop-R-Loy Galvanized Sheets were first introduced, metal workers have been torturing the sheet with every known test and operation. And the results are consistently the same – no flaking or peeling of coating.

That's because SOFTITE combines a soft, ductile base metal with the tightest zinc coating yet produced. So tight, in fact, that the coating will take anything that the base metal will!

Put SOFTITE to any test. See for yourself why the demand for SOFTITE has forced Wheeling to triple its production facilities in 1955. Try SOFTITE once and you'll see why actual users call Wheeling SOFTITE the best galvanized sheet yet produced.

For details call the nearest Wheeling sales office or warehouse.

*Galvanized steel does it better...*
*SOFTITE does it best!*

Wheeling

*Wheeling also manufactures a complete line of Galvanized Furnace Pipe, snap lock or closed seam Perimeter Heating or Air Conditioning Pipe, Style K Gutters, Square Conductor Pipe, Flashing, Valleys, and Fittings.*

**WHEELING CORRUGATING COMPANY, WHEELING, WEST VIRGINIA**

**For your convenience, warehouse stock immediately available at these locations: Boston, Buffalo, Chicago, Columbus, Detroit, Kansas City, Louisville, Minneapolis, New Orleans, New York, Philadelphia, Richmond, St. Louis. Sales Offices: Atlanta, Houston.**

# Package Mortgage Provides Tool for Project Sales

(*Continued from page* 112)

builders cannot fail to increase the volume of his own business and measurably widen his market.

### Sell The Builder First

Where builders of middle class project homes have a model house, little persuasion should be needed to sell them air conditioning equipment for that dwelling, so they can offer this equipment to their buyers on a package mortgage deal if desired. The relatively slight increase in the purchaser's monthly payment will mean little to many prospects who are already air conditioning minded.

The package mortgage will justify its existence from the warm air heating dealer's standpoint if it does no more than afford him a wholesale approach to residential or office building fields, which he may hitherto have avoided as retail. With or without the *open end* feature, package mortgaging supplies him with an effective tool for obtaining and handling business.

Perhaps the simplest procedure for the dealer would be somewhat as follows:

Beginning with his own bank, if possible, he finds an institution in the area that already grants package mortgage loans or is willing to incorporate a package clause in its mortgage form. The dealer's argument for such a clause — from the lender's angle — is that it gives the lender control of the entire property and all its appurtenances, together with an inclusive limit of the borrower's budgeting.

### Clause Can Be Attached to Existing Mortgage

The lender's whole mortgage form need not be rewritten. In most states the clause used by a large New York lender can be readily and legally inserted. This clause reads (with specific reference to air conditioning):

"Together with all fixtures and articles of personal property, including but not limited to . . . air conditioning systems, bathtubs, water closets, refrigerators, gas and electric fixtures, ranges, carpets, rugs, shades and all other furnishings in the building erected upon the premises now or thereafter attached to, or used in connection with the premises, shall be deemed to be and remain and form a part of the realty and are covered by the lien of this mortgage. If the lien of this mortgage be subject to a conditional bill of sale or chattel mortgage covering any such property, then in the event of any default in this mortgage all the right, title and interest of the mortgagor, in and to any and all such personal property is hereby assigned to the mortgagee, together with the benefits of any deposits or payments now or hereafter made thereon by the mortgagor or the predecessors or successors in title to the mortgagor in the mortgaged premises."

Should the bank's attorneys express legal doubt as to its lien on the packaged equipment, they can be referred to the following cases, which have established the law in this particular: Manufacturers Trust Co. vs Peck-Schwartz Realty Corp. 277 New York 283; General Synod of the Reformed Church in America vs Bonac Realty Corp. 297 New York 119.

In the first case it was decided that *personal* property (such as air conditioning) becomes "part of the security" for the realty mortgage loan if it "clearly appears from all the circumstances" that such was the *intent*. The second case brought out the legal situation wherein even articles which are not fixtures and "could be removed without injury to the structure" were attached to and used in connection with the premises and therefore were covered by the mortgage.

### Flexible Mortgage Would Establish Credit

Current trends in mortgage financing will open up large scale air conditioning opportunities in the project and development field. Horace Russell, general counsel of the United States Saving and Loan league, favors what he terms the *flexible* mortgage as source of "cradle-to-grave" home credit. He maintains "there is no reason why a family owning a home should ever have to use short term funds." With this end in view he lists the following provisions that might be included in his proposed *flexible* mortgage contract:

(1) A *package* mortgage clause as above described.

(2) An *open end* clause which permits the borrower to obtain additional advances on the mortgage for the purpose of installing improvements.

(3) A prepayment privilege which allows borrowers to prepay on account of the loan in any sum and at any time, as an insurance against foreclosure in the event of income curtailment.

(4) A *loan modification agreement* which can be used to change installment tempo, adjust interest rate, extend the loan, or for other purposes.

(5) Longer term and higher percentage loans for extra good risk purchasers.

The essence of the flexible mortgage idea is to help the borrowers build up a credit, enabling them, upon proper occasion, to obtain improved or additional equipment at long time, low interest terms.

The possibilities for the package mortgage and/or open end mortgage in his area should provide the dealer with more than one way to augment his income.

# Good things happen when you "sign up" with G.E.

This is no come-on! We'll tell you frankly that nobody is handing out blank checks simply because you "sign up" with G.E. There's no promise, no guarantee that your profits will jump.

But we will say this. Simply by putting that G-E monogram over your shop you're in a better position than ever to make bigger profits than ever—with no more effort than now (and probably a great deal less).

Why? Because virtually every family in your town has complete confidence in G.E. And you're the man who can turn that confidence into profits. You'll have a full line of home heating and cooling units, plus the famous G-E Air Wall system to offer your prospects—no matter what the design, type, size or location of their homes. Each unit is backed by the famous G-E Warranty that gives you and your customers more protection than anything you've yet seen. And that includes 5 years protection on the sealed-in system of the cooling unit.

This advertisement is not designed to make you switch to G.E. overnight. All we'd like you to do is send the coupon below...so we can send you facts that will help you make a sound decision. No obligation, of course. However, when you read about the great G-E line and the new G-E "Charlie Boggs" Profit Plan—well, we feel you'll agree that the good things in life come a lot faster and easier when you put G.E. to work for you.

**HOME HEATING & COOLING DEPT.**

*Progress Is Our Most Important Product*

**GENERAL ELECTRIC**

**GENERAL ELECTRIC CO.—HOME HEATING & COOLING DEPT. AA-65**
**BLOOMFIELD, N. J.**

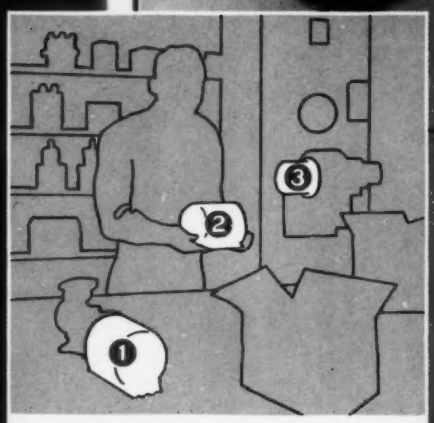
Yes, I want the facts on why "signing up" with G. E. will step up my sales and progress.

NAME _____

TYPE OF BUSINESS _____

ADDRESS _____

CITY _____ COUNTY _____ STATE _____




**THREE G-E MOTORS**

**1 circulating-pump motor 2 furnace blower motor 3 oil-burner motor can mean extra money in your pocket.**

# You Profit Four Ways When G-E Motors Are Installed on Heating Equipment You Sell

**1 G-E MOTORS HELP YOU SELL.** Prospects instantly recognize the G-E monogram as a symbol of reliability. Take advantage of this unmatched customer acceptance by pointing out that your equipment is powered by G.E. — leading manufacturer of motors for heating equipment. You'll find it helps close sales.

**2 THEY KEEP CUSTOMERS SOLD.** G-E engineers even run special under-water tests to prove that superior G-E insulation will provide maximum life in damp basements. Unique design which doubles lubrication life is one more G-E feature which contributes to dependability and customer satisfaction.

**3 THEY INSTALL EASIER, FASTER.** G-E motors are smaller and up-to-50% lighter than other motors — for easier installation in limited space. Rotation of burner and fan motors can be reversed by changing two easy-to-reach leads. Welded-on speed nut simplifies conduit connection. You save on installation.

**4 THEY'RE BACKED BY LOCAL SERVICE.** To provide prompt, efficient service for your customers, every major area has a G-E Small Motor Service Station.

***In all, these are four profitable reasons for suggesting that your suppliers power their products with G-E motors.*** General Electric Co., Schenectady, N.Y.

702-13

*Progress Is Our Most Important Product*

GENERAL ELECTRIC

# $1000.00 REWARD

**TO THE FIRST HEATING DEALER WHO CAN SHOW US A WARM AIR FURNACE THAT PROVIDES MORE COMFORT THAN PERFECTION WITH REGULAIRE*!**

## How to collect the reward!

● If you can show us a forced warm air furnace, with off-on fire and single-speed blower, exactly as it came from the manufacturer, with no extra attachments or accessories . . . and if that furnace will:

**1 Eliminate cold and hot blasts of air during its off-on operation.**

**2 Prevent stratifying of air in the home.**

**3 Eliminate cold, drafty floors.**

. . . and *not require* a higher thermostat setting than a Perfection Regulaire Furnace, then you can collect $1000 cash . . . right now!

It's only fair to warn you, though, that you just won't find a furnace that will equal Perfection with Regulaire. As you know, complete heating satisfaction depends upon meeting the requirements above. Only a Perfection furnace can do this because only Perfection has Regulaire—the amazing thermal control that provides FULL-TIME COMFORT.

We welcome comparisons, so try for the reward if you will. But there's an *easier* way to make that thousand dollars, and much more! Sell Perfection with Regulaire and the Hi-Lo fire. You owe it to yourself and your customers. Perfection Industries Inc. (formerly Perfection Stove Co.) 7616-F Platt Avenue, Cleveland 4, Ohio.

**INCREASE YOUR SHARE WITH REGULAIRE!**

YOUR HOME DESERVES

**A Perfection**

AUTOMATIC HEATING • AIR CONDITIONING

*Pat. pending

# Housing Census Heating Data

## Brockton, Mass. • Canton, O. • Houston • Richmond • Sioux City • South Bend

SUGGESTIONS on how a warm air heating dealer can use some of the housing data available from the Bureau of Census were given in the November 1954 American Artisan. Localities covered in the reports are metropolitan areas that are socially and economically integrated with the central city. Data for various areas has been reported regularly in American Artisan since May 1953. Additional reports will continue to appear regularly.

### Types of Fuel Used in Centrally Heated Dwelling Units

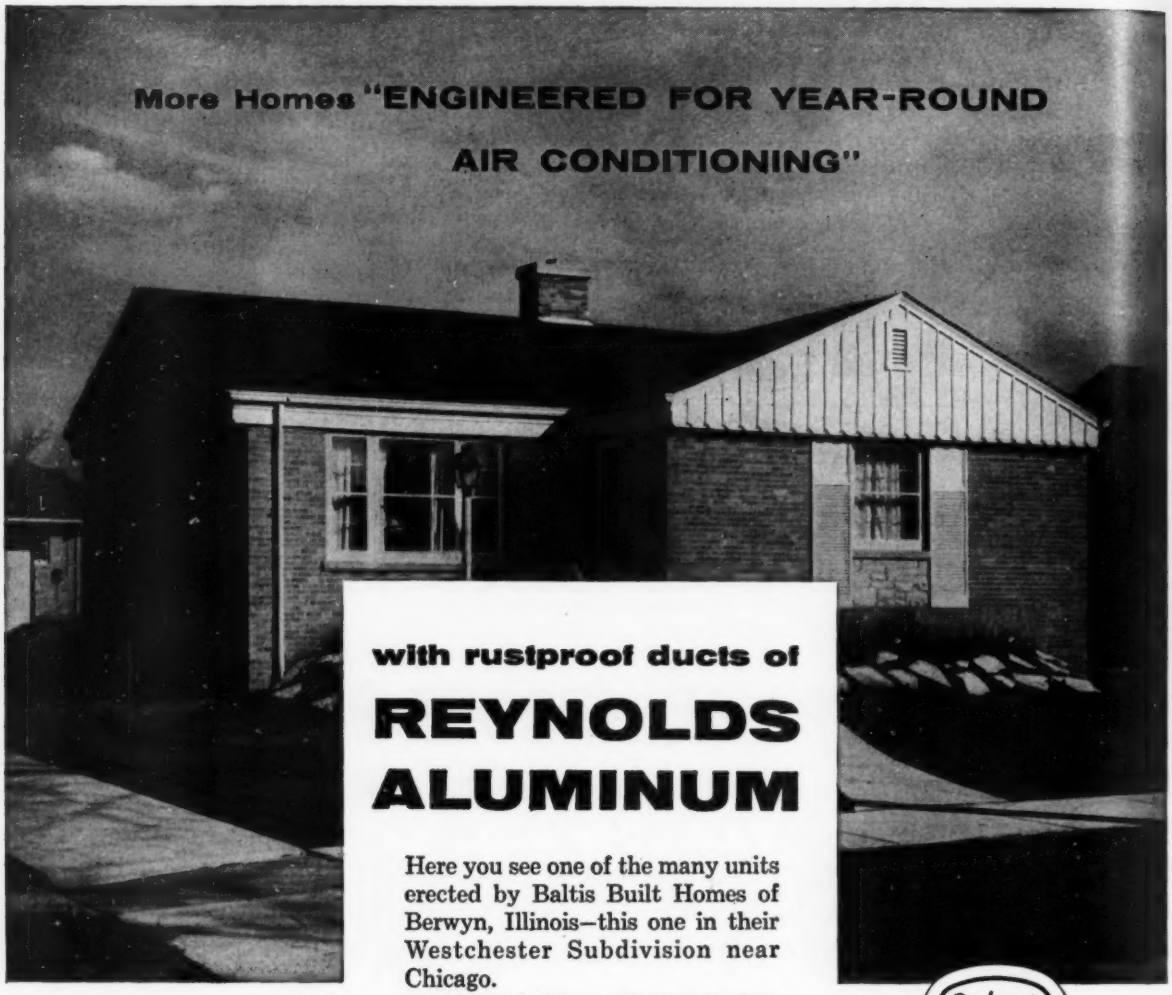
| | Standard Metropolitan Areas | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Brockton Mass. | | | Canton Ohio | Houston Texas | | Richmond Va. | | | | Sioux City Iowa | South Bend Ind. |
| | The area | Bristol County (Part) | Norfolk County (Part) | Plymouth County (Part) | Stark County | Harris County | The area | Richmond City | Chesterfield County | Henrice County | Woodbury County | St. Joseph County |
| All dwelling units | 38,995 | 1,886 | 5,284 | 31,825 | 83,153 | 257,154 | 94,539 | 66,434 | 10,584 | 17,521 | 31,945 | 60,732 |
| Number reporting heating equipment | 37,480 | 1,795 | 5,030 | 30,655 | 79,950 | 229,180 | 89,835 | 64,020 | 9,820 | 15,995 | 31,220 | 58,755 |
| Central heating | 26,760 | 1,380 | 3,700 | 21,680 | 67,060 | 43,070 | 46,475 | 33,770 | 3,430 | 9,275 | 23,495 | 45,005 |
| Coal | 11,360 | 625 | 1,730 | 9,005 | 46,225 | 755 | 19,155 | 16,800 | 790 | 1,565 | 11,935 | 33,045 |
| Wood | 140 | 15 | 20 | 105 | 115 | 190 | 130 | 90 | 30 | 10 | 145 | 175 |
| Utility gas | 1,130 | 40 | 110 | 980 | 18,080 | 41,230 | 4,465 | 4,120 | 65 | 280 | 5,180 | 2,435 |
| Bottled gas | 70 | ... | ... | 70 | 130 | 350 | 130 | 45 | 25 | 60 | 160 | 70 |
| Liquid fuel | 12,130 | 605 | 1,555 | 9,970 | 1,680 | 70 | 21,310 | 11,985 | 2,405 | 6,920 | 5,835 | 8,465 |
| Other fuel | 1,685 | 90 | 260 | 1,335 | 660 | 170 | 960 | 450 | 110 | 400 | 125 | 615 |
| Not reporting | 245 | 5 | 25 | 215 | 170 | 305 | 325 | 280 | 5 | 40 | 115 | 200 |

### Types of Nonfarm Dwelling Units, by Type of Heating and Year Built

| | Total occupied | | | | | | Owner occupied | | | Renter occupied | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | 1 dwelling unit, detached | Other 1, and 2 dwelling unit | 3 and 4 dwelling unit | 5 to 9 dwelling unit | 10 dwelling unit or more | Total | 1 dwelling unit, detached | All other dwelling units | Total | 1 dwelling unit, detached | Other 1, and 2 dwelling unit | 3 and 4 dwelling unit | 5 to 9 dwelling unit | 10 dwelling unit or more |
| **Standard Metropolitan Area of Brockton, Mass. — Parts of Bristol, Norfolk and Plymouth Counties** | | | | | | | | | | | | | | | |
| All occupied units | 36,185 | 17,495 | 8,805 | 7,195 | 2,015 | 675 | 21,090 | 15,290 | 5,800 | 15,095 | 2,205 | 4,915 | 5,415 | 1,910 | 650 |
| HEATING EQUIPMENT | | | | | | | | | | | | | | | |
| Central heating | 25,193 | 14,166 | 5,395 | 4,121 | 982 | 529 | 17,356 | 12,928 | 4,428 | 7,837 | 1,238 | 2,369 | 2,802 | 912 | 516 |
| Piped steam or hot water | 21,352 | 11,329 | 4,742 | 3,792 | 960 | 529 | 14,092 | 10,264 | 3,828 | 7,260 | 1,065 | 2,128 | 2,661 | 890 | 516 |
| Warm air furnace | 3,841 | 2,837 | 653 | 329 | 22 | ... | 3,264 | 2,664 | 600 | 577 | 173 | 241 | 141 | 22 | ... |
| Noncentral heating, with flue | 9,103 | 2,584 | 2,895 | 2,609 | 903 | 112 | 2,974 | 1,841 | 1,133 | 6,129 | 743 | 2,216 | 2,190 | 868 | 112 |
| Nonctrl. htng., without flue; or not htd. | 1,441 | 474 | 408 | 444 | 109 | 6 | 475 | 325 | 150 | 966 | 149 | 285 | 423 | 109 | ... |
| Not reported | 446 | 269 | 106 | 21 | 22 | 28 | 284 | 195 | 89 | 162 | 74 | 44 | ... | 22 | 22 |
| YEAR BUILT | | | | | | | | | | | | | | | |
| 1945 or later | 2,773 | 2,646 | 54 | 73 | ... | ... | 2,108 | 2,108 | ... | 665 | 538 | 54 | 73 | ... | ... |
| 1940 to 1944 | 504 | 477 | 27 | ... | ... | ... | 450 | 450 | ... | 54 | 27 | 27 | ... | ... | ... |
| 1939 or earlier | 32,195 | 14,071 | 8,589 | 6,950 | 1,960 | 625 | 18,316 | 12,619 | 5,697 | 13,879 | 1,452 | 4,752 | 5,195 | 1,855 | 625 |
| Not reported | 685 | 300 | 134 | 171 | 55 | 25 | 190 | 112 | 78 | 495 | 188 | 81 | 146 | 55 | 25 |
| **Standard Metropolitan Area of Canton, Ohio — Stark County** | | | | | | | | | | | | | | | |
| All occupied units | 73,945 | 52,465 | 13,115 | 4,910 | 2,480 | 975 | 50,345 | 44,795 | 5,550 | 23,600 | 7,670 | 8,445 | 4,160 | 2,375 | 950 |
| HEATING EQUIPMENT | | | | | | | | | | | | | | | |
| Central heating | 61,794 | 43,409 | 11,378 | 4,028 | 2,063 | 916 | 43,023 | 38,055 | 4,968 | 18,771 | 5,354 | 7,206 | 3,320 | 1,975 | 916 |
| Piped steam or hot water | 5,267 | 2,437 | 758 | 759 | 685 | 628 | 2,417 | 1,991 | 426 | 2,850 | 446 | 450 | 676 | 650 | 628 |
| Warm air furnace | 56,527 | 40,972 | 10,620 | 3,269 | 1,378 | 288 | 40,606 | 36,064 | 4,542 | 15,921 | 4,908 | 6,756 | 2,644 | 1,325 | 288 |
| Noncentral heating, with flue | 9,588 | 7,254 | 1,347 | 595 | 375 | 17 | 6,101 | 5,724 | 377 | 3,487 | 1,530 | 991 | 574 | 375 | 17 |
| Nonctrl. htng., without flue; or not htd. | 1,332 | 832 | 250 | 225 | 25 | ... | 454 | 407 | 47 | 878 | 425 | 203 | 225 | 25 | ... |
| Not reported | 1,209 | 972 | 140 | 62 | 18 | 17 | 745 | 611 | 134 | 464 | 361 | 45 | 41 | ... | 17 |
| YEAR BUILT | | | | | | | | | | | | | | | |
| 1945 or later | 8,665 | 8,452 | 160 | 53 | ... | ... | 8,058 | 8,006 | 52 | 607 | 446 | 133 | 28 | ... | ... |
| 1940 to 1944 | 5,552 | 4,425 | 347 | 337 | 443 | ... | 4,241 | 4,187 | 54 | 1,311 | 238 | 293 | 337 | 443 | ... |
| 1939 or earlier | 58,170 | 38,574 | 12,341 | 4,411 | 1,973 | 871 | 37,311 | 31,944 | 5,367 | 20,859 | 6,630 | 7,779 | 3,711 | 1,868 | 871 |
| Not reported | 1,533 | 1,015 | 267 | 109 | 63 | 79 | 710 | 658 | 52 | 823 | 357 | 240 | 84 | 63 | 79 |

(*Continued on page* 124)

This ad to Builders is a credit to you, the Heating Contractor! It appears in May "House & Home," June "Practical Builder," July "American Builder."



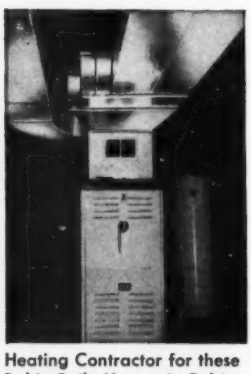

## with rustproof ducts of

# REYNOLDS ALUMINUM

Here you see one of the many units erected by Baltis Built Homes of Berwyn, Illinois—this one in their Westchester Subdivision near Chicago.

It is a lot of house for the modest price. It is not now air conditioned. But it is *engineered for year-round air conditioning*, with a duct system of Reynolds Aluminum. Wherever it is decided to use these ducts for cooled air, the moisture condensation cannot damage them.

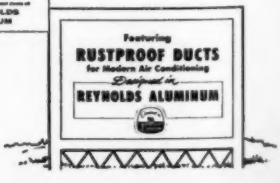
More and more builders are now selling air conditioning as a "future" like add-on rooms. And this "future" requires rustproof aluminum ducts. Reynolds is telling the story, strongly, in national magazine ads and important TV advertising. Take advantage of this promotion... sell future air conditioning in your homes. And identify your ducts as aluminum... Reynolds Aluminum.



Heating Contractor for these Baltis Built Homes is Robinson Furnace Company, Chicago. This is the Robinson installed duct system.

Designed in REYNOLDS ALUMINUM

**SIGNS FOR YOUR BUILDING SITES AVAILABLE... CONSUMER LITERATURE FOR DISTRIBUTION... ALSO "Designed in Aluminum" SEALS FOR IDENTIFICATION. Write to REYNOLDS METALS COMPANY, General Sales Office, Louisville 1, Kentucky.**




# REYNOLDS ALUMINUM

# SAVES 50% ON CLEAN AIR MAINTENANCE COSTS!

## THE FIRST TOTALLY NEW FILTER DEVELOPMENT . . . IN 25 YEARS

*This is not an idle claim . . . it's a fact . . . PROVEN UNDER ACTUAL INSTALLATION AND MAINTENANCE CONDITIONS.

Make no mistake about it . . . no matter *how small* your filter requirements . . . or *how large*, here is a completely new air filter development that can *absolutely cut your clean air maintenance costs in half.*

NO HEAVY TENSION OIL — Evans filters do not have a messy, sticky type of adhesive that is filthy to handle and difficult to clean. It is unnecessary and is forbidden in the use of Evans filters.

CLEAN WITH TAP WATER — Evans filters can be cleaned clean in minutes with nothing ever but tap water sprayed through an ordinary garden hose nozzle. They require no expensive fireproof room. No caustic cleaning solutions or agents. This eliminates all danger in the cleaning of Evans filters.

LIGHT WEIGHT CUT LABOR COSTS — Evans filters are all aluminum. Light to handle, to carry, to pick up. In spite of airtight fitting frames, Evans filters pull quickly and easily in and out of the frames. Take much less effort, less labor to handle. No latches . . . or lugs *required.*

**REMEMBER:** Initial costs for air cleaning equipment are not the big factors or controlling factors in the cost for clean air.

IT'S OPERATING COSTS THAT YOU MUST LIVE WITH AND THAT YOU MUST CONTROL.

EVANS FILTERS GIVE YOU THAT CONTROL. MAKE IT POSSIBLE FOR YOU TO SAVE 50% ON CLEAN AIR MAINTENANCE COSTS.

- ALL ALUMINUM
- EVERY PART PRECISION MADE
- HOLD UP TO 200% MORE DUST AND LINT WITHOUT HARMFUL RESTRICTION TO AIRFLOW
- GIVES LIFETIME SERVICE

## FREE CATALOG

MAIL COUPON TODAY

**THE GEORGE EVANS CORPORATION · MOLINE, ILLINOIS**

Gentlemen: I wish to know how to cut my clean air maintenance costs in half with a filter that gives lifetime service. Please send me new illustrated catalog.

Name .....

Company .....

Address .....

City ..... State .....

Evans

*Lifelong* AIR FILTERS

# Housing Census Heating Data

(*Continued from page* 121)

## Types of Nonfarm Dwelling Units, by Type of Heating and Year Built

| | Total occupied | | | | | | Owner occupied | | | Renter occupied | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | 1 dwelling unit, detached | Other 1, and 2 dwelling unit | 3 and 4 dwelling unit | 5 to 9 dwelling unit | 10 dwelling unit or more | Total | 1 dwelling unit, detached | All other dwelling units | Total | 1 dwelling unit, detached | Other 1, and 2 dwelling unit | 3 and 4 dwelling unit | 5 to 9 dwelling unit | 10 dwelling unit or more |
| **Standard Metropolitan Area of Houston, Tex. — Harris County** | | | | | | | | | | | | | | | |
| All occupied units | 232,265 | 167,920 | 31,160 | 16,225 | 11,055 | 5,905 | 128,110 | 117,365 | 10,745 | 104,155 | 50,555 | 24,225 | 14,940 | 8,680 | 5,755 |
| HEATING EQUIPMENT | | | | | | | | | | | | | | | |
| Central heating | 41,653 | 30,188 | 4,334 | 2,941 | 2,386 | 1,804 | 26,269 | 24,408 | 1,861 | 15,384 | 5,780 | 3,235 | 2,712 | 1,921 | 1,736 |
| Piped steam or hot water | 19,870 | 13,211 | 2,688 | 1,626 | 1,162 | 1,183 | 10,764 | 9,825 | 939 | 9,106 | 3,386 | 1,858 | 1,550 | 1,140 | 1,172 |
| Warm air furnace | 21,783 | 16,977 | 1,646 | 1,315 | 1,224 | 621 | 15,505 | 14,583 | 922 | 6,278 | 2,394 | 1,377 | 1,162 | 781 | 564 |
| Noncentral heating, with flue | 26,082 | 18,289 | 3,579 | 1,797 | 1,104 | 1,313 | 13,679 | 12,724 | 955 | 12,403 | 5,565 | 2,951 | 1,614 | 971 | 1,302 |
| Nonctrl. htng., without flue; or not htd. | 151,899 | 110,435 | 21,218 | 10,647 | 7,047 | 2,552 | 81,953 | 14,910 | 7,043 | 69,946 | 35,525 | 16,617 | 9,837 | 5,449 | 2,518 |
| Not reported | 12,627 | 9,021 | 2,027 | 836 | 514 | 229 | 6,211 | 5,333 | 878 | 6,416 | 3,688 | 1,421 | 775 | 337 | 195 |
| YEAR BUILT | | | | | | | | | | | | | | | |
| 1945 or later | 62,332 | 49,792 | 5,257 | 3,300 | 2,277 | 1,706 | 42,380 | 40,520 | 1,860 | 19,952 | 9,272 | 4,041 | 3,131 | 1,802 | 1,706 |
| 1940 to 1944 | 30,974 | 25,940 | 1,902 | 357 | 1,580 | 1,195 | 22,292 | 21,252 | 1,040 | 8,682 | 4,688 | 1,464 | 357 | 1,053 | 1,120 |
| 1939 or earlier | 129,422 | 86,542 | 22,028 | 11,457 | 6,672 | 2,723 | 60,170 | 52,814 | 7,356 | 69,252 | 33,728 | 17,088 | 10,409 | 5,379 | 2,648 |
| Not reported | 9,529 | 5,649 | 1,967 | 1,111 | 522 | 280 | 3,270 | 2,784 | 486 | 6,259 | 2,865 | 1,627 | 1,044 | 443 | 280 |
| **Standard Metropolitan Area of Richmond, Va. — Richmond City, Chesterfield and Henrico Counties** | | | | | | | | | | | | | | | |
| All occupied units | 87,135 | 46,490 | 24,955 | 7,300 | 3,635 | 4,755 | 46,500 | 37,780 | 8,720 | 40,635 | 8,710 | 17,135 | 6,605 | 3,450 | 4,735 |
| HEATING EQUIPMENT | | | | | | | | | | | | | | | |
| Central heating | 45,498 | 25,506 | 9,721 | 2,800 | 2,960 | 4,511 | 27,068 | 22,658 | 4,410 | 18,430 | 2,848 | 5,832 | 2,433 | 2,806 | 4,511 |
| Piped steam or hot water | 33,001 | 15,528 | 7,997 | 2,532 | 2,617 | 4,327 | 17,940 | 14,062 | 3,878 | 15,061 | 1,466 | 4,589 | 2,185 | 2,494 | 4,327 |
| Warm air furnace | 12,497 | 9,978 | 1,724 | 268 | 343 | 184 | 9,128 | 8,596 | 532 | 3,369 | 1,382 | 1,243 | 248 | 312 | 184 |
| Noncentral heating, with flue | 37,481 | 19,032 | 13,669 | 4,056 | 540 | 184 | 17,556 | 13,797 | 3,759 | 19,925 | 5,235 | 10,217 | 3,749 | 540 | 184 |
| Nonctrl. htng., without flue; or not htd. | 3,126 | 1,428 | 1,277 | 323 | 98 | ... | 1,269 | 904 | 365 | 1,857 | 524 | 927 | 323 | 83 | ... |
| Not reported | 1,009 | 524 | 289 | 119 | 36 | 41 | 585 | 419 | 166 | 424 | 105 | 158 | 99 | 21 | 41 |
| YEAR BUILT | | | | | | | | | | | | | | | |
| 1945 or later | 15,487 | 12,424 | 1,133 | 312 | 829 | 789 | 11,105 | 10,972 | 133 | 4,382 | 1,452 | 1,000 | 312 | 829 | 789 |
| 1940 to 1944 | 5,997 | 5,043 | 311 | 130 | 241 | 272 | 4,916 | 4,810 | 106 | 1,081 | 233 | 205 | 130 | 241 | 272 |
| 1939 or earlier | 64,181 | 28,310 | 23,042 | 6,650 | 2,539 | 3,640 | 29,968 | 21,647 | 8,321 | 34,213 | 6,663 | 15,621 | 5,955 | 2,354 | 3,620 |
| Not reported | 1,471 | 714 | 468 | 208 | 27 | 54 | 511 | 351 | 160 | 960 | 363 | 308 | 208 | 27 | 54 |
| **Standard Metropolitan Area of Sioux City, Iowa — Woodbury County** | | | | | | | | | | | | | | | |
| All occupied units | 27,605 | 18,580 | 3,360 | 2,065 | 1,915 | 1,685 | 16,940 | 15,105 | 1,835 | 10,665 | 3,475 | 2,160 | 1,625 | 1,800 | 1,605 |
| HEATING EQUIPMENT | | | | | | | | | | | | | | | |
| Central heating | 22,199 | 14,387 | 2,610 | 1,955 | 1,589 | 1,658 | 13,944 | 12,307 | 1,637 | 8,255 | 2,080 | 1,522 | 1,535 | 1,513 | 1,605 |
| Piped steam or hot water | 3,696 | 892 | 393 | 391 | 774 | 1,246 | 1,057 | 732 | 325 | 2,639 | 160 | 226 | 271 | 736 | 1,246 |
| Warm air furnace | 18,503 | 13,495 | 2,217 | 1,564 | 815 | 412 | 12,887 | 11,575 | 1,312 | 5,616 | 1,920 | 1,296 | 1,264 | 777 | 359 |
| Noncentral heating, with flue | 4,816 | 3,865 | 647 | ... | 304 | ... | 2,689 | 2,539 | 150 | 2,127 | 1,326 | 535 | ... | 266 | ... |
| Nonctrl. htng., without flue; or not htd. | 338 | 197 | 41 | 80 | 20 | ... | 171 | 151 | 20 | 167 | 46 | 41 | 60 | 20 | ... |
| Not reported | 250 | 131 | 62 | 30 | ... | 27 | 135 | 108 | 27 | 115 | 23 | 62 | 30 | ... | ... |
| YEAR BUILT | | | | | | | | | | | | | | | |
| 1945 or later | 1,587 | 1,421 | 109 | 22 | 35 | ... | 1,284 | 1,228 | 56 | 303 | 193 | 53 | 22 | 35 | ... |
| 1940 to 1944 | 1,156 | 778 | ... | ... | 346 | 32 | 640 | 640 | ... | 516 | 138 | ... | ... | 346 | 32 |
| 1939 or earlier | 24,533 | 16,217 | 3,143 | 2,020 | 1,500 | 1,653 | 14,907 | 13,156 | 1,751 | 9,626 | 3,061 | 2,027 | 1,580 | 1,385 | 1,573 |
| Not reported | 328 | 163 | 108 | 22 | 35 | ... | 108 | 80 | 28 | 220 | 83 | 80 | 22 | 35 | ... |
| **Standard Metropolitan Area of South Bend, Ind. — St. Joseph County** | | | | | | | | | | | | | | | |
| All occupied units | 54,285 | 42,110 | 7,065 | 3,305 | 1,195 | 610 | 39,590 | 36,235 | 3,355 | 14,695 | 5,875 | 4,360 | 2,760 | 1,110 | 590 |
| HEATING EQUIPMENT | | | | | | | | | | | | | | | |
| Central heating | 41,539 | 32,082 | 5,160 | 2,803 | 1,016 | 478 | 31,240 | 28,352 | 2,888 | 10,299 | 3,730 | 2,857 | 2,280 | 974 | 458 |
| Piped steam or hot water | 4,333 | 2,521 | 554 | 515 | 362 | 381 | 2,403 | 2,030 | 373 | 1,930 | 491 | 322 | 384 | 362 | 371 |
| Warm air furnace | 37,206 | 29,561 | 4,606 | 2,288 | 654 | 97 | 28,837 | 26,322 | 2,515 | 8,369 | 3,239 | 2,535 | 1,896 | 612 | 87 |
| Noncentral heating, with flue | 11,226 | 8,925 | 1,669 | 454 | 178 | ... | 7,516 | 7,093 | 423 | 3,710 | 1,832 | 1,317 | 432 | 136 | ... |
| Nonctrl. htng., without flue; or not htd. | 911 | 673 | 192 | 24 | ... | 22 | 469 | 427 | 42 | 442 | 246 | 150 | 24 | ... | 22 |
| Not reported | 606 | 430 | 43 | 24 | ... | 109 | 363 | 363 | ... | 243 | 67 | 43 | 24 | ... | 109 |
| YEAR BUILT | | | | | | | | | | | | | | | |
| 1945 or later | 8,242 | 7,921 | 219 | 102 | ... | ... | 7,326 | 7,165 | 161 | 916 | 756 | 87 | 73 | ... | ... |
| 1940 to 1944 | 4,585 | 3,531 | 642 | 171 | 241 | ... | 3,533 | 3,269 | 264 | 1,052 | 262 | 378 | 171 | 241 | ... |
| 1939 or earlier | 39,613 | 29,628 | 5,872 | 2,788 | 757 | 568 | 27,903 | 25,120 | 2,783 | 11,710 | 4,508 | 3,662 | 2,272 | 700 | 568 |
| Not reported | 1,825 | 530 | 332 | 244 | 197 | 22 | 808 | 181 | 127 | 1,017 | 349 | 233 | 244 | 169 | 22 |

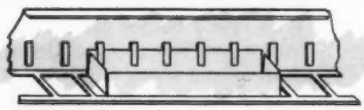
# *Now*
## only Lima diffusers have *BOTH*
# Pre-cut Boot Openings and Automatic Pushbutton Damper

*Lima*
***Series 70*** **with damper**

**Push in—damper automatically opens and locks. Push up — it automatically snaps closed. Turn pushbutton screw with fingers to balance.**

**Series *75* without damper for economy installations.**

## NEW, EASIER INSTALLATION



**Base of diffuser has pre-cut openings separated by removable ⅜" mullions, allowing boot to be located any place in bottom of diffuser. Boot fastening clips stamped in back section hold boot in place. Pre-cut openings eliminate cutting and save considerable time and expense.**

**Steel strip furnished with unit to seal openings not used.**

- ***Automatic Pushbutton Damper Control*** gives fingertip control of air in heating and cooling, with positive air shut-off.
- ***Easier Installation*** with new pre-cut boot openings in base—saves considerable time and expense.
- ***Efficient Air Diffusion*** over wide area assures complete indoor comfort and induces imperceptible recirculation of room air. Correct vertical angle prevents air from striking room occupants or scrubbing wall.
- ***Modern Styling*** with horizontal louvers that harmonize beautifully with horizontal lines of floor, baseboard and window. Permanent medium Beige finish. Does not require re-painting unless desired.
- ***Ideal for Cooling*** in new or existing installations. Double spring tension on full length damper eliminates rattling and keeps valve from blowing shut due to higher air velocities.
- ***New Series 75 For Economy Installations*** is identical with Series 70 but without damper and automatic pushbutton control, for use where damper is not required.

Now Lima has everything you want in a baseboard diffuser . . . for heating and cooling jobs. Check the Lima Baseboard Diffuser, feature by feature, and you'll find that Lima is your best buy for economical heating and cooling installations that assure complete customer satisfaction.

**See your Lima jobber or write direct for new literature and prices on Lima Perimeter Extended Baseboard Diffusers.**

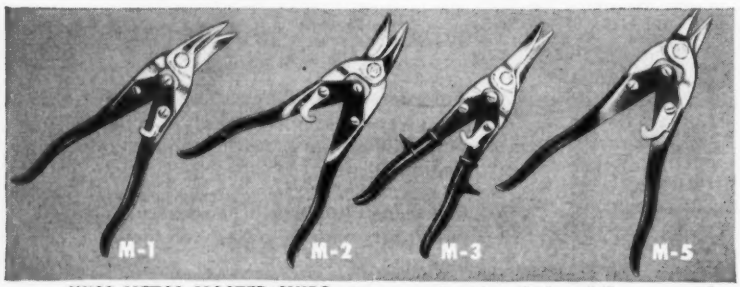
*Lima* REGISTER CO.
Lima, Ohio

MEMBER INDOOR COMFORT

**Distributed Exclusively By Heating Wholesalers And Manufacturers.**

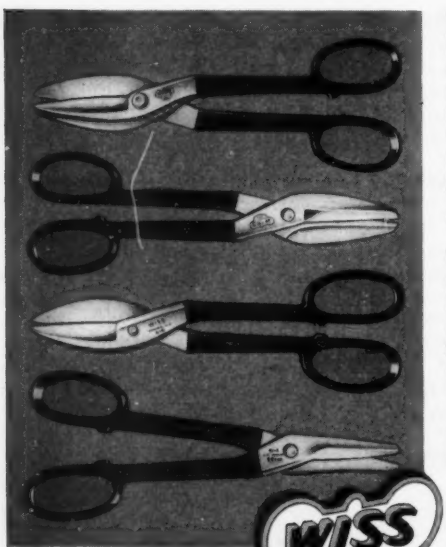
# "WE'VE SOLD WISS SNIPS SINCE 1901—BEST VALUE ON THE MARKET TODAY"

*Mr. J. P. Townley, vice president and general manager, Townley Metal and Hardware Co., Kansas City, Mo., gives one big reason why his firm likes to feature Wiss metal cutting snips. There are several reasons why they are the choice of professional workers everywhere—why they sell better, with fewer returns. Wiss snips are produced largely by the handwork of skilled workers. Each pair is rigidly tested and guaranteed perfect. Bolts are set precisely to reduce wear and to increase cutting power with the least effort.*




**WISS METAL MASTER SNIPS:** Compound action design delivers amazing cutting power. These 10" snips cut with about one-half the effort required for standard 12½" snips. One edge serrated to prevent slipping. M-1 (cuts left) and M-2 (cuts right) are designed to cut the most intricate scrolls and circles. M-3 is for shallow arcs and straight cutting. M-5 Bulldog Heavy Duty snips are tops for notching, nibbling and cutting shallow arcs in sheet metal as heavy as 16 gauge.

Wiss inlaid blades are made of high carbon crucible steel welded to a hot drop-forged frame to provide the extra service demanded by professional workers.



**WISS INLAID SNIPS**

High carbon crucible steel welded to a hot drop-forged frame provides that *extra* service demanded by professional users everywhere. Six Straight Cutting sizes from 11½" to 17", including Bulldog Snips for notching. Three Combination* Cutting sizes, 12½", 13½" and 14½".

**WISS SOLID STEEL SNIPS**

For those whose requirements are less specialized than the professional user. Hot drop-forged of fine carbon steel, they meet or exceed government specifications. Four straight cutting sizes, 8" to 12½". Four Combination* Cutting sizes, 7", 10", 13" and 16" Bulldog Snips for notching.

*Made with straight blades, but ground and shaped so they readily cut curves and irregular shapes as well as straight.

**J. WISS & SONS CO., NEWARK 7, NEW JERSEY**

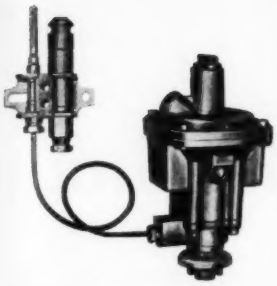
*Manufacturers of Shears, Scissors, Pinking Shears, Metal Cutting Snips and Garden Shears*

Wiss snips are hot drop-forged of the finest steels available.

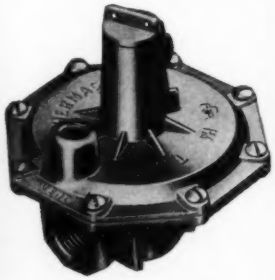
Highly skilled craftsmen make final adjustments to assure that Wiss snips will cut perfectly for a long time.

# THERMAC

## GAS CONTROLS



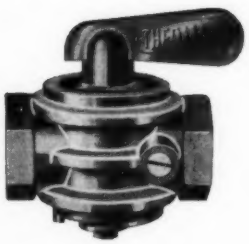
SR-100 Combination Pressure Regulator and Thermo-Electric Safety Pilot. ½". Capacities up to 90,280 B.T.U.



T-11 and T-15 Appliance Regulators. ½" and ¾". Capacities up to 284,000 B.T.U.

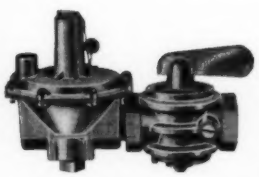
SR-200 Combination Pressure Regulator and Thermo-Electric Safety Pilot. ½" and ¾". Capacities up to 226,200 B.T.U.

Model TROD Pilot Regulator.



Aluminum Alloy Manual Main Gas Shut-off Valve. Free flow. ⅜", ½", ¾" and 1".

TR-34D-155, T-50, T-60 and T-70 Regulators. ¾" to 2½". Capacities up to 2,160,000 B.T.U.



Assembly of Thermac Gas Shut-off Valve and Appliance Regulator.

### — *finest controls on the market today*

There's no substitute for dependability in a gas control for the proper operation of today's modern automatic appliances. Manufacturers for whom Thermac controls are engineered and built find the following design principles planned into each Thermac product:

1. Higher B.T.U. capacity, per size.
2. More compact. Easy and less expensive to install.
3. Fewer parts readily accessible without breaking line connections.
4. Dependable in performance and rugged to withstand years of hard service.
5. Finest materials and workmanship. Resistant to corrosion. Trouble free.

Examine any Thermac product thoroughly. Test it. Compare its performance, ease of adaptability, price and quality. Send for recommendations and samples. See how readily Thermac controls fit into your program.

***Call Thermac first for immediate delivery.***

THERMAC

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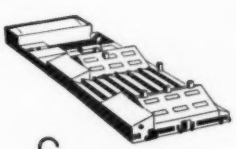
**800 East 108th Street, Los Angeles 59, California**



*"24 years experience building gas controls."*

Certified by A.G.A.

# Versatility Sponsors Growth of Sheet Aluminum

**A hybrid comprised of a wide range of different alloys and tempers, aluminum has come into favor in the sheet metal shop as a workable, lightweight material which answers many previously unfulfilled needs**

**By G. W. Birdsall**
**Reynolds Metals Co.**

THE WORKER in the average sheet metal shop probably has less experience handling and working sheet aluminum than other commonly specified materials. This conclusion is evident after a brief study of the annual consumption figures for various kinds of shop fabricated sheet. While aluminum sheet and plate have been consumed in large quantities for aircraft production, building and large scale manufacturing, it has only recently begun to show increased usage by sheet metal shops.

### Plan for Stepped Up Aluminum Work

Many shops are reporting an annual increase in the volume of aluminum they use. In addition, customers for sheet metal products are asking for specialty items as well as standard equipment made of aluminum sheets. This attitude is expected to push the volume even higher. Accordingly, sheet metal contractors can expect to be called upon to handle more aluminum sheet for all kinds of jobs. With this in mind, American Artisan inaugurates a series of articles dealing with various standard shop procedures for the fabrication of aluminum sheets into specialty and standard items. Shop men will find in these articles tips, recommendations, step-by-step illustrations and tabular information for quick reference.

Before examining specific techniques in detail, however, we might review quickly some interesting characteristics of the metal itself. The applications for aluminum are many and its acceptance so widespread that we tend to forget just how recent a development the production of commercial aluminum actually is. Only a little more than a century ago, this metal cost $545 a pound and was more precious than either gold or silver. The high cost of aluminum in those days, of course, resulted from the great difficulty and expense entailed in its production. Today, however, aluminum oxide can be extracted from bauxite ore and changed into metallic aluminum with such efficiency that its cost per pound can be figured in cents rather than in dollars.

### Components Improved Constantly

Hand in hand with the revolutionary changes in the production of aluminum have gone a number of no less revolutionary changes in the metal itself. When we speak of aluminum today, we are really talking not about a single metal, but about a whole family of metals — a wide range of alloys and tempers, each of which has its own particular properties and characteristics. Subjected to the same conditions or fabricating operations, any two of these alloys will often behave in a widely differing, sometimes contradictory fashion. Often a particular alloy has been specifically developed for a single specialized application, and is later found through experimentation to be suitable for other jobs as well. An alloy which works

(*Continued on page* 132)

TABLE 1—TYPICAL MECHANICAL Properties of Aluminum for Sheet Metal Work

| Alloy No. and Temper | Tensile Strength psi | Yield Strength psi | Shear Strength psi | Fatigue Strength psi | Brinell Hardness No. | Min. Elongation in 2 in.—percent THICKNESS—IN. .006-.007 | .008-.012 | .013-.019 | .020-.031 | .032-.050 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1100-H12 | 15,000 | 13,000 | 10,000 | 6,000 | 28 | .. | .. | 3 | 4 | 6 |
| 1100-H14 | 17,000 | 14,000 | 11,000 | 7,000 | 32 | .. | 1 | 2 | 3 | 4 |
| 1100-H16 | 20,000 | 17,000 | 12,000 | 8,500 | 38 | 1 | 1 | 1 | 2 | 3 |
| 1100-H18 | 24,000 | 21,000 | 13,000 | 8,500 | 44 | 1 | 1 | 1 | 2 | 3 |
| 3003-H12 | 18,000 | 15,000 | 12,000 | 8,000 | 35 | .. | .. | 3 | 4 | 5 |
| 3003-H14 | 21,000 | 18,000 | 14,000 | 9,000 | 40 | .. | 1 | 2 | 3 | 4 |
| 3003-H16 | 25,000 | 21,000 | 15,000 | 9,500 | 47 | 1 | 1 | 1 | 2 | 3 |
| 3003-H18 | 29,000 | 25,000 | 16,000 | 10,000 | 55 | 1 | 1 | 1 | 2 | 3 |

AIR CONTROL

AIR CONTROL PRESENTS THE **New** NO. 188

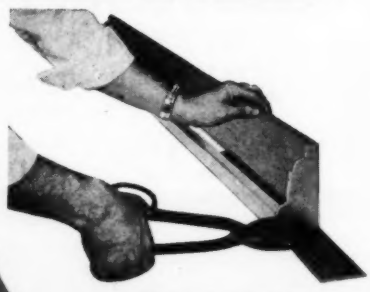
# BASEBOARD DIFFUSERS

## with New built-in ROTARY DAMPER

**Here, at last, is the diffuser you've been looking for with the new, exclusive, built-in rotary damper . . . now an integral part of the face. See it — compare it — Air Control's rotary damper is the only damper engineered to maintain a constant pattern and velocity at any opening. Gone forever are annoying whistles and wall scrubbing; an end to expensive call-backs and troublesome installations. For heating or cooling it can't be beat.**

## The finest, most efficient diffuser damper ever built

**Uniform air pattern regardless of volume. Silent at any degree of opening. Simpler and faster to install. Easily balanced at the face. It can't be matched!**



## Plus New ADJUSTO BOTTOM

**Saves installation time and cost and permits installation at any duct location. Simply locate desired position of duct . . . pull out Adjusto Bottom . . . snip off the excess bottom . . . insert into other end of diffuser, and complete installation.**

**ORDER TODAY. GET AIR CONTROL NO. 188 DIFFUSERS IN 4 FT. AND 2 FT. LENGTHS. SEND FOR BULLETIN NO. 146-AC.**

Air Control
PRODUCTS, INC.
DEPT. A. COOPERSVILLE, MICHIGAN

AUTO-FLO CORP., IN COOPERATION WITH PARTICIPATING WHOLESALERS WILL GIVE YOU A

# FREE

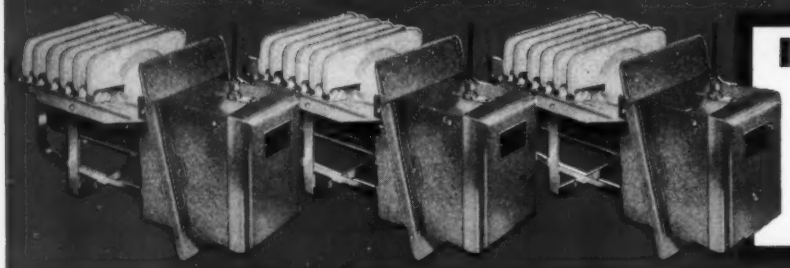
*Auto flo*

# FUEL OIL FILTER

WITH THE PURCHASE OF...

## *3 Auto flo "100"*

## AUTOMATIC HUMIDIFIERS



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Over a hundred years of on-the-firing-line selling experience wrapped up in a 58-page self-seller . . . makes customers out of prospects. It's the highest quality . . . plastic-coated pages . . . beautiful self-easel. And, it covers all of that big ROUND OAK line . . . heating, both oil and gas, and that all-new air conditioning line.

There's nothing else like it . . . ROUND OAK has it!

**WRITE, WIRE OR CALL TODAY!**

Round Oak Co., Inc., Dowagiac, Michigan
Rush me full details on the new Round Oak Sales Presentation.

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*City*_____ *State*_____

☐ I am now a Round Oak dealer. ☐ I am not now a Round Oak dealer.

AA

# Aluminum Takes Its Place in Sheet Metal Work

(*Continued from page* 128)

perfectly for one kind of job or set of conditions will not necessarily perform well for another job or under different conditions.

### Alloys Share Common Properties

As different from each other as the various alloys and tempers of aluminum are, however, they all share some common properties and characteristics. Any alloy or temper will have such characteristics as lightness of weight, freedom from rust and corrosion resistance. Ease of fabrication, attractive natural appearance, substantial strength, high surface reflectivity of heat and light and low surface friction are other characteristics. It is these qualities, common to all the alloys and tempers of aluminum, which are responsible for its acceptance and widespread application in all facets of modern life. And it is these qualities which make it suitable for such applications as ducts, flashing, gutters, downspouts, counter tops and specialties.

### Popularity Based on Inherent Features

Since it is likely that the average shop man will want to know more about the working of this metal, the following features are detailed:

*Fabrication*: Aluminum is easily blanked, cut, sawed, sheared, formed, bent, stretched, rolled, hammered, pierced, welded, soldered, riveted, screwed or nailed. It generally requires less man or machine power to perform any of these operations than with any other kind of sheet metal. And since it weighs only one-third as much as most other sheet metals, aluminum is less fatiguing to handle in the quantities demanded by normal shop production.

*Appearance*: Since it is a homogeneous material, the interior of the sheet and the surfaces are exactly alike. No matter how sharp the forming, even up to 180 deg bends, the resulting joint will be smooth and even.

*Decreased tool wear*: Easier workability results in a minimum wear on shear blades, drills, dies, lock former rolls and other tools. This is reflected in lower maintenance costs.

Before examining individual shop procedures, the sheet metal contractor should have a working knowledge of aluminum alloys, their availability, their designations and the sizes and thicknesses in which sheets are furnished. Tables 1 through 4 treat such subjects as mechanical properties as applied to sheet metal work, gage systems, equivalent sheet thicknesses and weight of coils.

Future articles in this series will deal with recommended practices and procedures for standard shop operation with aluminum sheet, such as cutting, drilling, bending, fastening, soldering and welding.

**TABLE 2—GAGE SYSTEMS for Aluminum and Galvanized Steel Sheet**

| Gage No. | Aluminum: American or B & S | Galvanized Core Only: Manufacturer's Standard | Galvanized Core Plus Coating: Approximate Thickness |
|---|---|---|---|
| | Thickness, In. | | |
| 15 | 0.05707 | 0.0673 | 0.0703—0.0713 |
| 16 | 0.05082 | 0.0598 | 0.0628—0.0638 |
| 17 | 0.04526 | 0.0538 | 0.0568—0.0578 |
| 18 | 0.04030 | 0.0478 | 0.0508—0.0518 |
| 19 | 0.03589 | 0.0418 | 0.0448—0.0458 |
| 20 | 0.03196 | 0.0359 | 0.0389—0.0399 |
| 21 | 0.02846 | 0.0329 | 0.0359—0.0369 |
| 22 | 0.02535 | 0.0299 | 0.0329—0.0339 |
| 23 | 0.02257 | 0.0269 | 0.0299—0.0309 |
| 24 | 0.02010 | 0.0239 | 0.0269—0.0279 |
| 25 | 0.01790 | 0.0209 | 0.0239—0.0249 |
| 26 | 0.01594 | 0.0179 | 0.0209—0.0219 |
| 27 | 0.01420 | 0.0164 | 0.0194—0.0204 |
| 28 | 0.01264 | 0.0149 | 0.0179—0.0189 |
| 29 | 0.01126 | 0.0135 | 0.0165—0.0175 |
| 30 | 0.01003 | 0.0120 | 0.0150—0.0160 |
| 31 | 0.008928 | 0.0105 | 0.0135—0.0145 |
| 32 | 0.007950 | 0.0097 | 0.0127—0.0137 |
| 33 | 0.007080 | 0.0090 | 0.0120—0.0130 |
| 34 | 0.006305 | 0.0082 | 0.0112—0.0122 |
| 35 | 0.005615 | 0.0075 | 0.0105—0.0115 |

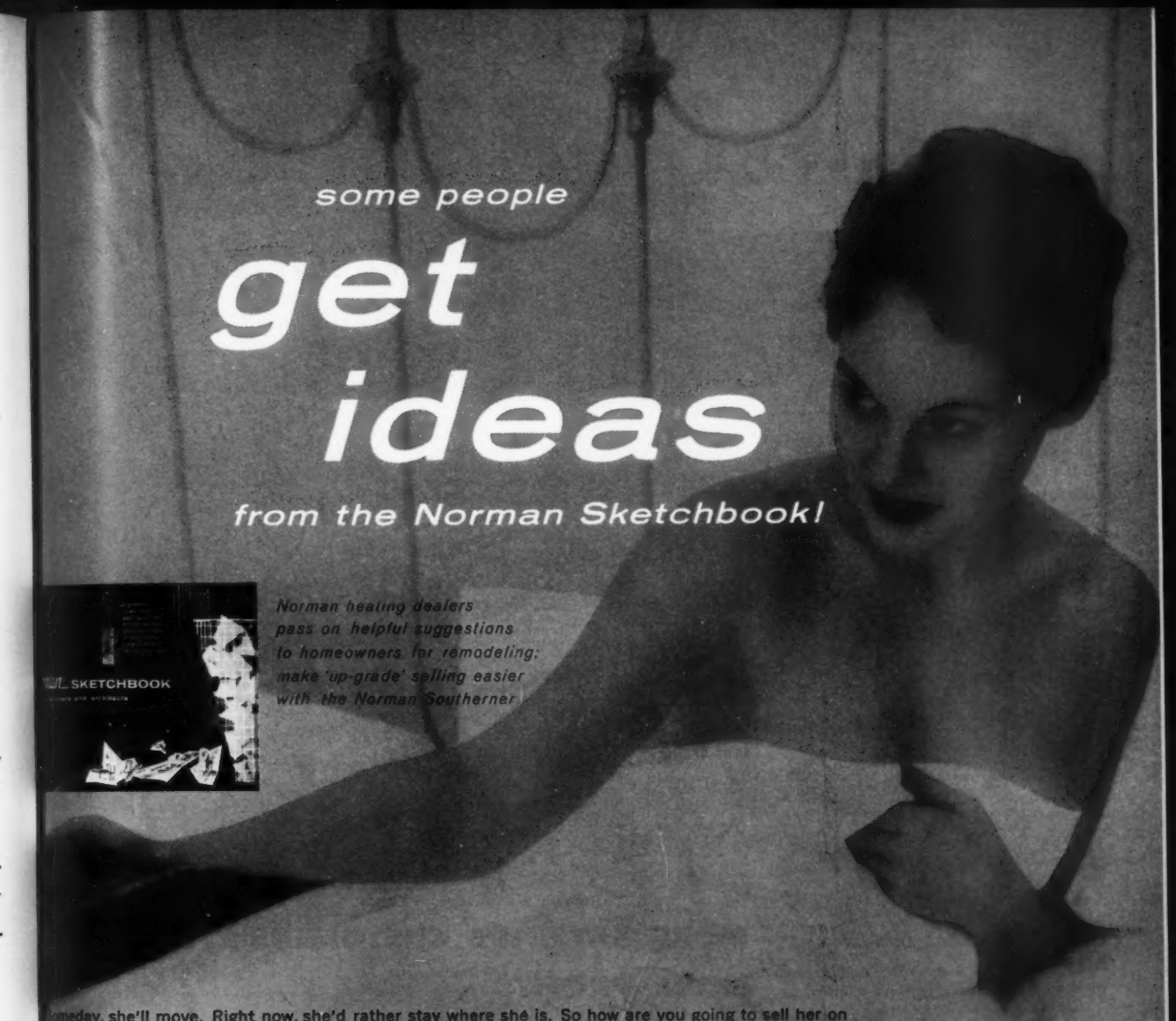
**TABLE 3—EQUIVALENT Sheet Thicknesses**

| GALVANIZED: Mfrs. Std. Gage No. | GALVANIZED: Thickness, In. | ALUMINUM: B & S Gage No. | ALUMINUM: Thickness, In. |
|---|---|---|---|
| 18 | 0.0478 | 13 | 0.07196 |
| | | 16 | 0.05082 |
| 20 | 0.0359 | 16 | 0.05082 |
| | | 19 | 0.03589 |
| 22 | 0.0299 | 17 | 0.04526 |
| | | 20 | 0.03196 |
| 24 | 0.0239 | 19 | 0.03589 |
| | | 22 | 0.02535 |
| 26 | 0.0179 | 22 | 0.02535 |
| | | 25 | 0.01790 |
| 28 | 0.0149 | 24 | 0.02010 |
| | | 26 | 0.01594 |
| 30 | 0.0120 | 25 | 0.01790 |
| | | 28 | 0.01264 |
| 32 | 0.0097 | 27 | 0.01420 |
| | | 30 | 0.01003 |
| 34 | 0.0082 | 28 | 0.01264 |
| | | 31 | 0.008928 |

**TABLE 4—WEIGHT OF Aluminum Coils in Pounds**

| Arbor Size In. | COIL WIDTHS: 24 In. Min. | 24 In. Max. | 30 In. Min. | 30 In. Max. | 36 In. Min. | 36 In. Max. |
|---|---|---|---|---|---|---|
| 10 | 420 | 840 | 525 | 2800 | 630 | 2800 |
| 12 | 420 | 840 | 525 | 2800 | 630 | 2800 |
| 16 | 780 | 1560 | 975 | 2800 | 1170 | 2800 |
| 20 | 780 | 1560 | 975 | 2800 | 1170 | 2800 |

Note: Variations in weight for the same size arbor and coil widths are due to the thickness of the metal being rolled.



*some people*

# *get ideas*

## *from the Norman Sketchbook!*




*Norman heating dealers pass on helpful suggestions to homeowners for remodeling; make 'up-grade' selling easier with the Norman Southerner!*

Someday, she'll move. Right now, she'd rather stay where she is. So how are you going to sell her on replacing her old furnace with a compact Norman Southerner. You've been using the Norman Sketchbook to sell new home buyers on the space-saving convenience of the Norman Southerner. Why not demonstrate the Norman Sketchbook to heating prospects who want their present home to be a little more comfortable to live in?

Use the Norman Sketchbook to sell her on replacing outdated heating equipment with the Norman Southerner. Each page of the Norman Sketchbook illustrates a different home, together with a sketch of the floor plan and cut-away drawings showing the complete heating installation. Chances are, you'll be able to show her a home that's very similar to the one she's living in right now.

What wouldn't she give to have all this space, the extra closet, the convenience of more room for living! No reason why she can't. Not after you explain how the Norman Southerner will let her plan her "new" remodeled home with a feeling of more space, with the interior arranged for greater living comfort and convenience. If you haven't already received your copy of the Norman Sketchbook, write or call. Might as well get your share of that replacement market right away!

If you ever find your prospect in a spot like this, better leave your Norman Sketchbook and beat a hasty retreat. We'll send you an extra copy for your trouble!

**NEW LOCAL ADVERTISING PACKAGE**

Another big promotion for Norman heating dealers. A complete package of advertising and sales promotion material... including local newspaper advertising mats. Send for your free copy today!

**The Norman Southerner**

**HORIZONTAL FORCED-AIR GAS FURNACE**

**Norman PRODUCTS COMPANY** • 1150 Chesapeake Avenue Columbus 12, Ohio

Manufacturers of a Complete line of Gas Heating and Air Conditioning Equipment.

# *quiet as a flame!*

**V-579**
**GAS VALVE**

*You'll have–* **MORE SATISFIED CUSTOMERS . . .**
**MORE PROFITS**

**ACCEPTED BY ALL UTILITIES**

with V-579 Gas Valves by DETROIT CONTROLS. No click, no hum, no noise because the V-579 is operated by positive opening, positive closing "Biflex" motor!

Install these V-579 gas valves close to living rooms or sleeping rooms, secure in the knowledge that they will operate dependably and *quietly*. Their operation is independent of gas pressure and gravity. Ideal for *all* types of gas, in any domestic heating unit! ½ inch to 1¼ inch sizes.

Talk to your Detroit Controls Wholesaler *Today* . . . or write for Bulletin 229.

DETROIT CONTROLS CORP. manufactures a complete line for the air conditioning and refrigeration industries as well as heating.

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Division of AMERICAN RADIATOR & STANDARD SANITARY Corporation

Representatives in Principal Cities • Canadian Representatives:
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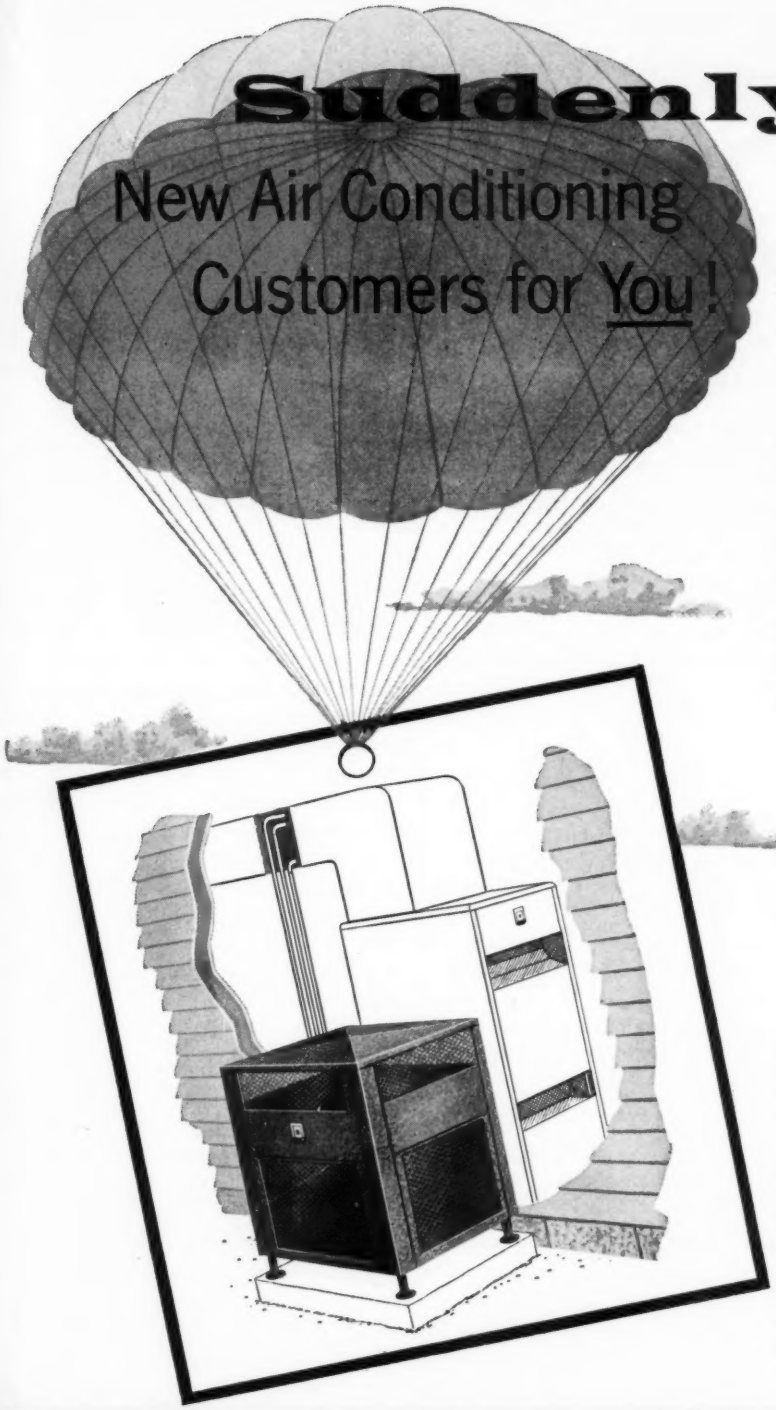
**AUTOMATIC CONTROLS for REFRIGERATION**
**AIR CONDITIONING • DOMESTIC HEATING • AVIATION • TRANSPORTATION • HOME APPLIANCES • INDUSTRIAL USES**
***Serving home and industry***
**AMERICAN-STANDARD • AMERICAN BLOWER • CHURCH SEATS & WALL TILE • DETROIT CONTROLS • KEWANEE BOILERS • ROSS EXCHANGERS • SUNBEAM AIR CONDITIONERS**

# Suddenly...

## New Air Conditioning Customers for You!



How many people are there in your neighborhood who've been *wanting* air conditioning but have held back because of high water rates or water restrictions?

Every one of those people is now—suddenly—an excellent prospect for an air conditioning installation. American-Standard's new Sunbeam outdoor air-cooled unit requires no water whatsoever—uses only electricity and air. And it provides fully automatic control of temperature and humidity.

What's more, this unit combines economically with the home owner's new or existing heating system . . . enables you to offer year 'round comfort at a *competitive price.*

**New SUNBEAM**
AIR-COOLED UNIT
by
**AMERICAN-Standard**

*Requires No Water*
*Uses No Floor Space*

Available in 2 hp and 3 hp sizes, the New Sunbeam air-cooled condensing unit is designed to cool the entire house. As shown here, in a typical installation, it ties in with a Sunbeam evaporator unit in the furnace ductwork, and only a few connections are needed. Besides doing away with water and saving indoor floor space, this outdoor system has another advantage—it keeps all mechanical operating parts outside the house for *quiet* comfort inside. Cooling unit is covered by Sunbeam 5-Year Protection Plan.

**NEW!** *Sunbeam 1955 Cooling Sales Aids for dealers—a complete promotional package designed to help you locate prospects quickly and close orders fast. Ask your Sunbeam distributor for full details.*

SUNBEAM
HEATING-COOLING PRODUCTS

# SUNBEAM
## AIR CONDITIONER DIVISION

American Radiator & Standard Sanitary Corporation
Elyria, Ohio

*Serving home and industry:* AMERICAN-STANDARD • AMERICAN BLOWER • CHURCH SEATS & WALL TILE
DETROIT CONTROLS • KEWANEE BOILERS • ROSS EXCHANGERS • SUNBEAM AIR CONDITIONERS

YOU AND THE LAW

*'Reasonable Prudence' Can Limit*

# Dealer's Liability for Safety Devices

**The court must decide whether the lack of precautionary measures is a product of neglect or is based on an assumption that the customer will treat the equipment intelligently. Next, the term "prudence" must be defined as it applies to the case**

THE QUESTION of the extent of a dealer's responsibility for providing certain safety devices with equipment was raised in a court action brought on the death of a purchaser who caused his warm air heating unit to explode.

The purchaser had removed a plug on the burner which closed an opening provided for insertion of a mechanical control if the original electrical control had to be replaced. Removal of the plug, which could be accomplished only by use of a wrench, permitted gas to accumulate in the combustion chamber and explode.

In the resulting action it was contended that the dealer was negligent in not providing proper warning of the danger of removal of the plug. The dealer maintained that in not placing warning tags on the equipment he had followed the usual custom of his trade.

### Prudence of the Action is a Factor

In its decision in favor of the dealer the court said of such precautionary measures and of their absence in the imposition of liability on a dealer:

"The observance of a custom or failure to observe it does not necessarily amount to due care or the lack of it but tends to show what a reasonably prudent person would do under the same or similar circumstances."

### Circumstances Determine Responsibility

This same rule that the absence of adequate safety devices is not in itself negligence was a feature in a suit resulting from the death of a hotel guest in a fire which, because of the inadequacy of the fire alarm system, destroyed the hotel.

"What alarm systems were on the market, the generality of their use, how they worked, what they cost, whether they were on display or sale in the community or otherwise widely advertised and known to the hotel trade, are all relevant facts," said the court. "They would have supplied a factual basis for the decision of whether a reasonable man in this hotel owner's position would have known about these devices, would have believed them practical and economically feasible for his hotel and whether such a device if installed before the fire, would probably have provided a timely warning."

A landlord in an east central state was charged by tenants with negligence that caused the death of a 13 month child who drank kerosene from an open vent on a small pipe which had been run from a kerosene tank to the end of a stove.

### Custom Not Always a Criterion

The court in its conclusion that no liability rested on the landlord for the absence of safety devices, outlined the rule under which the courts determine whether or not a dealer has exercised reasonable prudence in furnishing safety appliances:

"In determining whether the conduct of a dealer under a given state of facts was characterized by the exercise of ordinary care it is proper to show the customary way of doing such things in the business at hand but such facts are not controlling. They serve only to throw light on the question since a customary way may be a negligent way.

"It must be determined under all of the facts whether the matter was managed in such a way as a person of reasonable prudence would have managed it."

---

*Albert W. Gray, author of this article, has had over 20 years' experience as an attorney in the courts of New York City. He has written widely on legal matters and is the author of The Family Legal Adviser and Purchase Law Manual.*

---

*[Note: While this discussion applies to actual cases, it should be remembered that legal rules vary in different states.]*

# ...for $uccessful $elling!

★
AMERICA'S BEST FURNACE VALUE! AMERICA'S TOP PROFIT LINE!
★

HEATWAVE

GAS FIRED
# FURNACES

## Build Additional Sales and Maintain Goodwill

★
Compare Heatwave with any other line —
**PERFORMANCE-WISE!**
★
Compare Heatwave with any other line —
**PROFIT-WISE!**
★
**No other line of heating equipment offers such a great combination of SERVICE and SALES APPEAL!**

**EVERY HEATWAVE MODEL:**

- Factory Assembled
- Fire Tested
- Ready to Install
- Competitive in Price
- Cast Iron Burners
- Smart in Appearance
- Economical to Operate
- 10-Year Factory Warranty

*Southwest manufactures a complete line of 2 and 3-ton Residential Air Conditioners for use as companion units with any Forced Air Furnace.*

**The HEATWAVE COUNTER-FLO . . .**

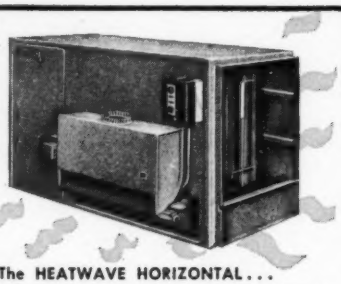
BTU Input
80,000
100,000
120,000

for perimeter and under floor heating; can be installed in closet, alcove or utility room with minimum of duct work. Very economical installation.

New, Improved, **VENTED RECESSED WALL HEATER**

BTU Input
Single Wall
27,500
Dual Wall
35,000
45,000

Finest Heatwave quality, fits in 16" centered stud spacing. Ideal for homes, apartments, offices, stores and motels. Minimum installation cost.



**The HEATWAVE HORIZONTAL . . .**

BTU Input
60,000
80,000

for space saving installations in homes without basements; installs in attics, under floors, in service porches, attached garages; suspends from joists in homes with basements.

**The HEATWAVE FLOOR FURNACE . . .**

BTU Input
27,500
35,000
50,000
65,000 75,000

accomplishes the long-sought objective in floor furnace manufacture: QUIET operation, combined with efficiency, economy and long life.

**The HEATWAVE HI-BOY . . .**

BTU Input
80,000
100,000
120,000
140,000
160,000

designed to meet the need of better home heating at lower cost. Completely automatic. Built-in draft diverter Cast iron burner.

WRITE OR WIRE — GET THE FACTS

HEATWAVE

**SOUTHWEST MANUFACTURING COMPANY**

BOX 28 — *Subsidiary of the F. E. Myers & Bro. Co.* — AURORA, MO.

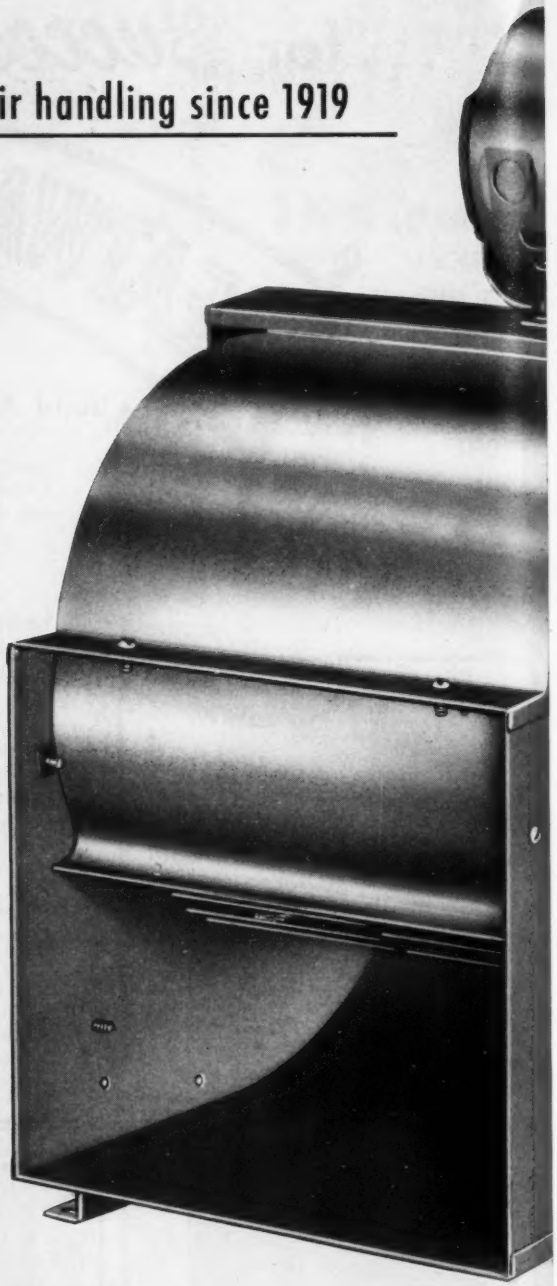
**Brundage** ...for better air handling since 1919

# Quiet Please...

Quiet is the word for Brundage Blowers — and the key to happy customers who don't even want to know they have a blower.

Add the practically service-free performance of extra-strong construction and you have a sure hit with your dealers too.

Whether you manufacture heating or cooling equipment, you can be sure of the quality to match your finest product when you choose Brundage . . . quality proven since 1919.



**ASK FOR SAMPLE BLOWERS TO PROVE BRUNDAGE VALUE IN YOUR OWN LAB.**

**RELIABLE SERVICE— WHEN YOU NEED IT!**

**WRITE FOR FREE LITERATURE PRICES ON REQUEST**

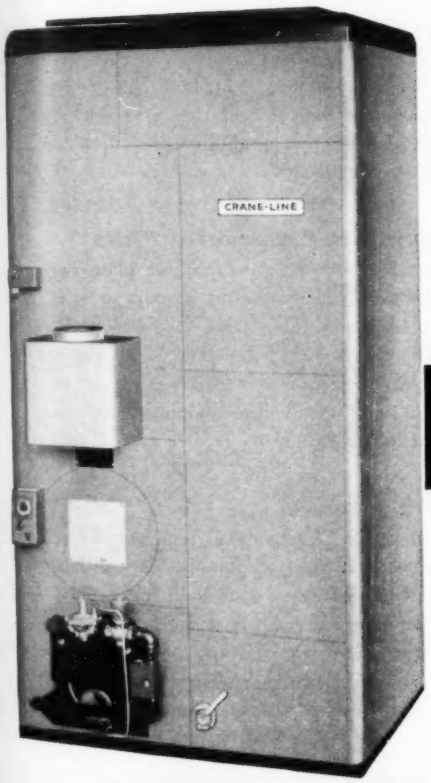
THE Brundage COMPANY

504 N. PARK STREET • KALAMAZOO, MICH.

Phone 2-0251

# NEW!

# COUNTERFLOW YEAR 'ROUND AIR CONDITIONERS BY CRANE




## Especially designed for perimeter systems

Now there's a year 'round air conditioner for use in basementless homes with perimeter heating systems.

It's the new Crane *COUNTERFLOW* Year 'Round Air Conditioner that supplies warm air *or cool air* from the bottom, to run through ducts in the slab or under the floor.

Like the Crane Hi-Boy Year 'Round Air Conditioner, the new Counterflow models have *two* compressors (instead of the usual one) for greater efficiency and comfort. It's easy to install, comes mostly assembled in three cartons, and there's no refrigeration work to worry about.

Factory sealed refrigeration system is fully warranted under Crane's Five-Year Protection Plan and slides easily in and out of the cabinet. Very small and compact—and it's priced to sell in projects.

See your Crane Branch or Crane Wholesaler for all the facts.

**Crane's famous Hi-Boy Year 'Round Air Conditioner** for regular installations. Both Counterflow and Hi-Boy have two compressors for better humidity control and lower power consumption.

CRANE CO.
General Offices: 836 S. Michigan Ave., Chicago 5, Ill.
VALVES • FITTINGS • PIPE • KITCHENS • PLUMBING • HEATING

CRANE

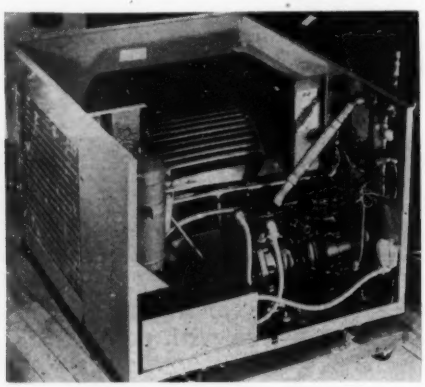
**CRANE STARTS ITS SECOND CENTURY OF QUALITY**
**Founded July 4, 1855**

# EQUIPMENT DEVELOPMENTS

**The latest information on manufacturers' developments is presented here with brief summaries of the applications of these products. For additional product information which is available, see this month's New Literature department.**

### *Air Cooled Air Conditioners*

LINE OF air cooled air conditioning systems in 3 and 5 ton remote units and 2 and 3 ton self contained units as well as improved line of water cooled systems — Lennox Furnace Co., 200 S. 12th Ave., Marshalltown, Ia. "High Side" remote unit has large condenser, 15 or 18 in. blowers which are "buried" in the cabinet



so air discharges through compressor chamber and through weather louvers; unit can be installed outdoors or over rafters in garage or carport. Dimensions are 35 × 43½ × 24 in. "Low Side" units containing evaporator and expansion valve and filter are 23 × 20½ × 14; some models have blowers, others use furnace blower. Self contained air cooled models have condenser blower said to handle 900-1000 cfm per ton of cooling; units also have evaporator blowers, automatic control panel and heating-cooling thermostat. Water cooled equipment includes 2, 3, 4, 5 and 6 ton units; single stage units are available in 2, 3 and 5 ton sizes, two stage units with two compressors are in 4, 5 and 6 ton sizes.

### *Electronic Round Thermostat*

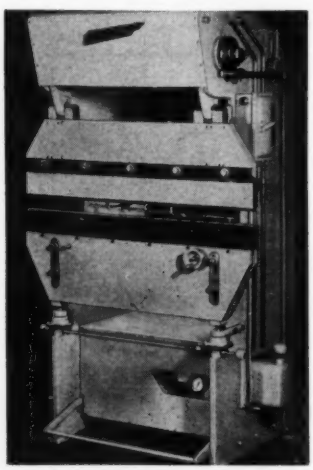
"GOLDEN CIRCLE" redesigned home temperature control system with electronic round thermostat — Minneapolis Honeywell Regulator Co., 2726 Fourth Ave. S., Minneapolis 8, Minn. Gold disc is 2⅜ in. in diameter; mounted in conventional location, it works with outdoor temperature sensing element and control center to adjust indoor comfort according to outdoor weather changes. Control center operates on a 24 volt circuit and is supplied with a transformer and 15 ft of cable with a remote terminal block to allow mounting the "brain" unit wherever desired. Two models and three different control centers are available. All models use plastic outdoor "anticipator" unit and indoor and outdoor thermostats contain tiny bobbins of temperature sensitive wire. Temperature changes are sent from both thermostats to the control center as low voltage electronic signals. Indoor thermostats contain bimetal thermometer which is calibrated to the single dial.

### *Furnace Humidifier Evaporator Plate*

"THIRS-TEE" furnace humidifier evaporator plate designed to resist caking of deposits on evaporator surfaces — Viking Air Conditioner Div., National Radiator Co., 5601 Walworth Ave., Cleveland 2. A water-absorbent by-product of rice is used in plates to eliminate "leaching out" of alkaline components which are said to cause caking.

### *Hydraulic Press Brake*

"DI-ACRO HYDRA-POWER" hydraulically operated press brake said to develop 12 tons of pressure and with a 36 in. length of bed and ram — O'Neill-Irwin Mfg. Co., 501 8th Ave., Lake City, Minn. Length of stroke for each job can be pre-set and ram can be stopped or reversed at any desired point, according to the company. Power is applied to a rotary hydraulic cylinder



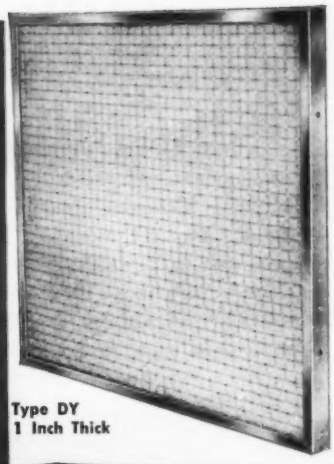
which is linked to the cam shaft; cylinder's oscillating action has a maximum movement of 270 deg. One bending cycle is completed in the forward movement of the cylinder, another cycle is completed on return. Production rate of 60 strokes per minute is possible on a ¼ in. stroke; at full 1½ in. opening, 24 strokes per minute can be maintained, the company reports.

(*Continued on page* 142)

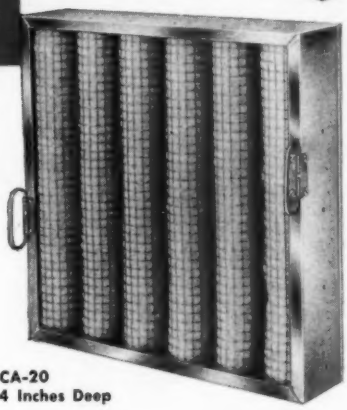
# SURE YOU'LL PLEASE 'EM with *NEW* DYCON®

## the MODERN AIR FILTER

*for* **WARM AIR FURNACES**
**AIR CONDITIONERS**
**AIR CONDITION SYSTEMS**



Type DY
1 Inch Thick



CA-20
4 Inches Deep

CA-24
8 Inches Deep

### PERMANENT—QUICKLY AND EASILY CLEANED

Amazing new plastic dry-type media in rustproof aluminum frame efficiently traps dirt by accumulated static charge. Quickly and easily rinsed clean with cold running water—and immediately ready for re-use, good as new, time after time, year after year!

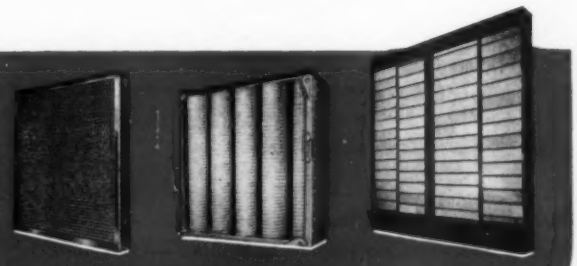
### REAL PROFITMAKER:

Greater sale price of this permanent-type filter—and its attractive mark-up—will put more money in your pockets. National advertising and promotion supports your sales. Contact your Continental representative, or write direct, for the profitable details.

AIR CONTINENTAL FILTERS

P. O. BOX 1647 LOUISVILLE 1, KY.

**CONTINENTAL AIR FILTERS Inc.**



## equipment developments

*(Continued)*

Ram speed is constant, operator controls opening for added safety features. Unit takes up 23 × 27 in. floor space. Brake bands and clutch discs are eliminated; ram guides are hardened and ground.

### Gas or Oil Fired Furnaces

"FOUR BUDGETEERS" gas or oil fired forced warm air furnaces — Richmond Radiator Co. Div., Reynolds Metals, Co., Box 111, Metuchen, N.J. Lowboy, highboy and counterflow models are rated at 70,000, 90,000 or 110,000 Btuh input; "Horizontal" develops 60,000, 80,000, 100,000, 120,000 or 140,000 Btuh. Designed to fit in most types of houses with basements, split

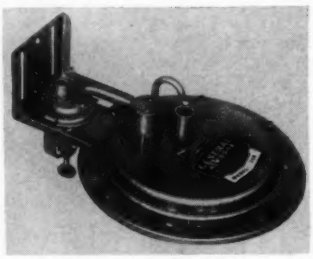
levels, closets, utility rooms, attics or crawl spaces, the four units feature continuous air circulation with large capacity, slow speed blowers. Motors are mounted in rubber, corrugated asbestos insulation has aluminum foil facing. Gas heating elements are all welded, gas tight heavy gage steel with large heating surface and long flue travel, the company states.

### Small Oil Burner Motor

"VEST POCKET" 1/12 hp oil burner with same starting torque as many ⅛ hp oil burner motors — General Electric Co., 1 River Rd., Schenectady 5, N.Y. Developed to provide smaller components for oil burners, the burner motor is ½ in. shorter and weighs over 1 lb less than the company's ⅛ hp motors; 6⅜ in. "N" mounting flange is standard with smaller "M" (5½ in. diameter) rabbet optional.

### Furnace Humidifier

MODEL 250 warm air furnace humidifier said to filter, measure, and replenish water level automatically — General Filters, Inc., 43800 Grand River Ave., Novi, Mich. Regulator feeds cold, filtered water to the evaporating pan which is mounted directly atop the furnace heat exchanger. Rubber diaphragm valve maintains proper water level in the pan, according to the com-



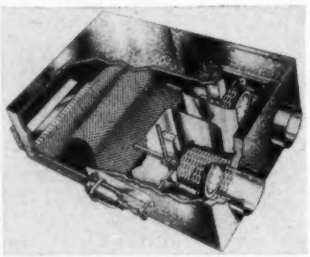
pany; as water is evaporated in the pan the regulator responds to maintain constant level. Force of water entering from cold water line opens regulator valve and water flows through to the evaporating pan. Water dripping from a hydrant into a standpipe indicates rate of evaporation and humidity. Feed water passes through sediment bowl and screen before entering regulator.

### Safety Gas Valve

GAS VALVE designed to combine safety features of fixed adjustment lock nut types with spring loaded plug types — Deutsch Co., 7000 Avalon Blvd., Los Angeles. Fixed adjustment valve has spring takeup; spring is in the head of the plug to prevent unseating of plug. Brass or steel bar stock is used for the body; plug is brass. Steel is protected by cadmium plating. Valves can be used with natural, manufactured, mixed or LP gases.

### High Pressure Air Diffuser

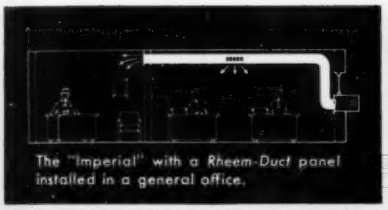
"KNO DRAFT" dual duct high pressure air diffuser said to vary temperature by mixing hot and cold air while total air delivery remains uniform — Connor

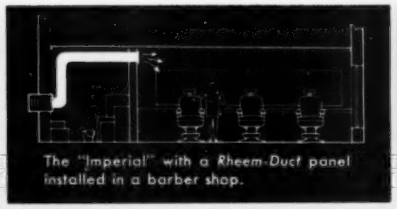


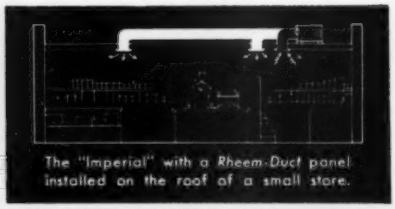
Engineering Corp., 500 5th Ave., New York 36. Both air inlets are fitted with dampers of double perforated concentric sleeves and felt edged pistons. Outer sleeves slide back and forth over fixed inner sleeves, governing size of holes through which air flows. Air volume is set by a rack and pinion; mixing is obtained by a 90 deg movement of a horizontal shaft, permitting use of

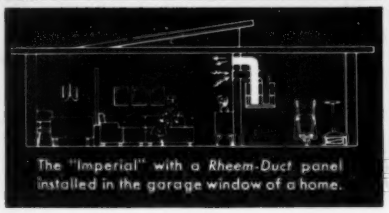
# Presenting the new Rheem "IMPERIAL" multipurpose window air conditioner

Here's a revolutionary Rheem "first" which provides multiple space air conditioning from a single window unit. The Rheem "Imperial" unit is designed for duct work applications as well as conventional single room air conditioning. All "Imperial" units are available with either the *Rheem-Air* or *Rheem-Duct* interchangeable front panels.


The "Imperial" with a *Rheem-Duct* panel installed in a general office.


The "Imperial" with a *Rheem-Duct* panel installed in a barber shop.


The "Imperial" with a *Rheem-Duct* panel installed on the roof of a small store.


The "Imperial" with a *Rheem-Duct* panel installed in the garage window of a home.

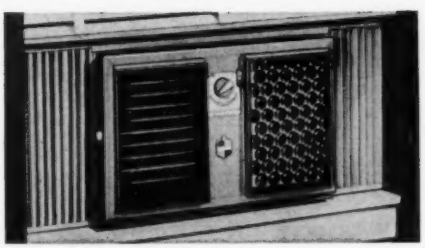
The "Imperial" with a *Rheem-Duct* panel installed in the attic space of a home.

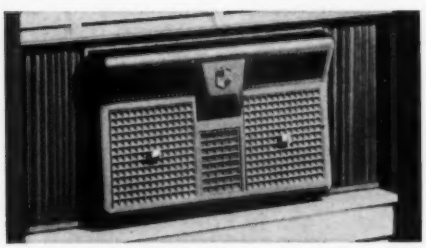
The "Imperial" with a *Rheem-Air* panel installed in a typical window.

**All of these typical installations and many more are possible because of the following Rheem "Imperial" features:**

- ★ Large, powerful centrifugal supply air blowers
- ★ Die-formed aluminum steel front panel
- ★ Oversize cooling and condenser coils
- ★ Design based on 120° outside temperature
- ★ Electric heating for cool weather use

| AVAILABLE IN | ¾ HP | 1 HP | 1½ HP | 2 HP |
|---|---|---|---|---|
| | Up to 500 sq. ft. | Up to 700 sq. ft. | Up to 900 sq. ft. | Up to 1200 sq. ft. |


This "Imperial" unit has the functional *Rheem-Duct* front panel for multiple space air conditioning with duct work.


This "Imperial" unit has the beautiful *Rheem-Air* front panel for premium performance in room air conditioning.

Rheem

**RHEEM MANUFACTURING CO., 7600 SOUTH KEDZIE AVENUE, CHICAGO 29, ILL.**

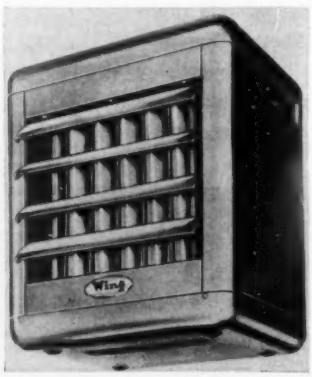
## equipment developments

*(Continued)*

a standard damper operator controlled by a thermostat. Unit is in capacities up to 1000 cfm operating at static pressures up to 6 in. water gage.

### Gas Fired Unit Heaters

LINE OF gas fired utility unit heaters with horizontal discharge — L. J. Wing Mfg. Co., 306 Vreeland Mills Rd., Linden, N.J. Included are two designs of unit




heaters and a duct type heater. Combustion chamber and heat exchanger are 16 gage aluminized steel welded into one piece assembly. Other components are built in draft diverter, four bladed aluminum propeller fans, cast iron burners and automatic safety controls. Units range from 50,000 to 230,000 Btuh input. Line includes heaters for ceiling suspension and downward discharge through fixed or revolving discharge outlets.

### Corrosion Resistant Blower Wheel

"AC" LINE OF end supported blower wheels said to be corrosion resistant — Morrison Products, Inc., 16816 Waterloo Rd., Cleveland 10, O. Wheels are available in seven diameters from 10 to 20 in. and nine widths from 6 to 20 in. Bore size ranges from ¾ in. on smaller wheels in single unit to 2 in. when two or more wheels are mounted in a single shaft. Larger bores are also available. Wheels are galvanized steel, finished in epon resin paint and baked at high temperature for long periods to build up corrosion resistance, the company states.

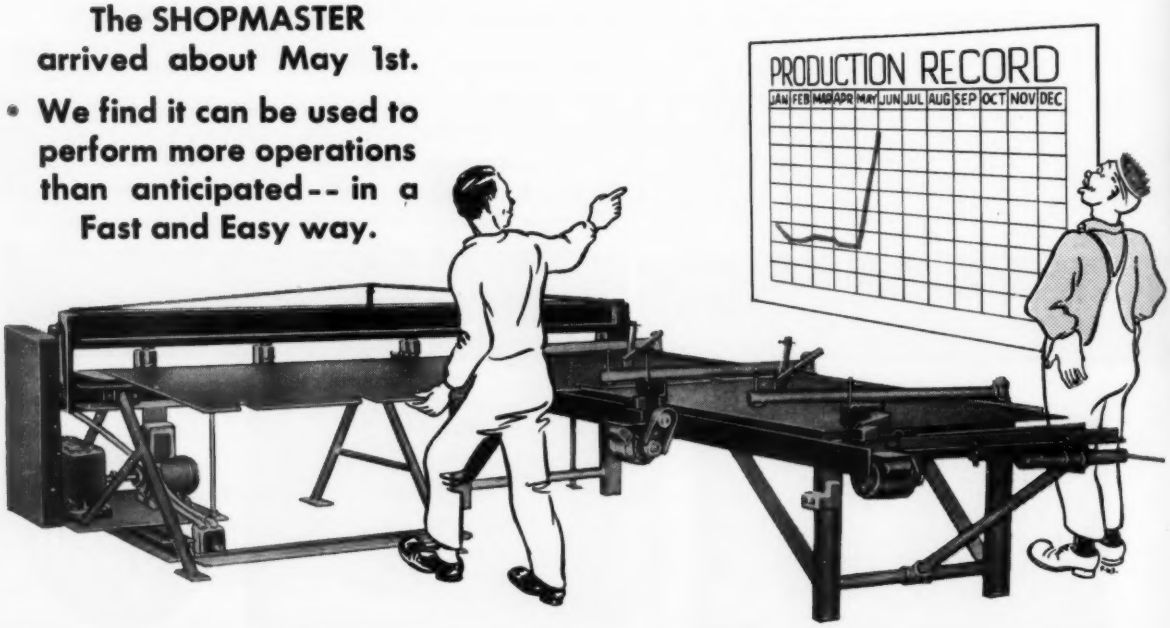
### Heavy Duty Oil Burners

THREE OIL burners with twin nozzles and sand cast aluminum alloy housing, designed for large loads — Nu-Way Corp., 2416 Fourth St., Rock Island, Ill. Model CO-800 has a firing range from 3 to 8 gph. Burner has two stage pump, delayed action valve and heavy transformer. Models XL-1500 (8 to 15 gph) and XL-2000 (15 to 20 gph) have dual ignition system and two independent transformers. Electronic primary


Now we'll make it, EZEE!

The SHOPMASTER arrived about May 1st.

- We find it can be used to perform more operations than anticipated -- in a Fast and Easy way.




ENGEL SHEET METAL EQUIPMENT, INC.
3001 UNION AVE. ST. LOUIS 15, MO.

Because Field Controls are round they can always be leveled, regardless of the angle of the flue pipe.

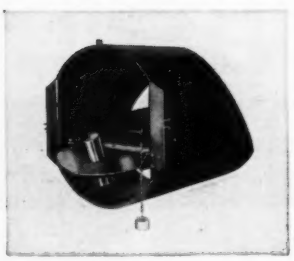


# The first name in heating is yours

To most home-owners the name of their dealer is more familiar and more important than the name of their furnace. Consumers know that a good dealer will not install poor equipment. And we know that, too. For you have proven your loyalty to quality through more than 15,000,000 Field Draft Control installations.

**field**

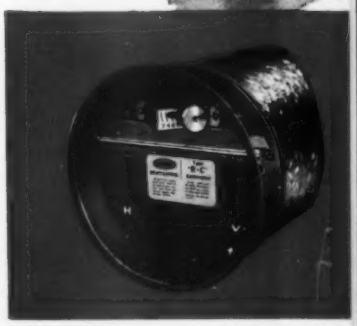
**FIELD TYPE M**—6" through 32" sizes for oil and coal fired domestic and commercial furnaces and boilers.



**FIELD TYPE M G**—6" through 32" sizes for gas fired commercial heating plants — approved by leading gas companies and engineers from coast to coast.

## DESIGNED FOR MAXIMUM CAPACITY

The Field R-C illustrated above and to the right shows the great reserve capacity available to meet any emergency condition. So great is this capacity that, for example, a 7" control is often used on an 8" pipe, yet the control is sensitive to draft variations as fine as .01". Made in 7" and 9" sizes for flues from 6" through 10".



**FIELD CONTROL DIVISION**
**of H. D. CONKEY & COMPANY, Mendota, Illinois**

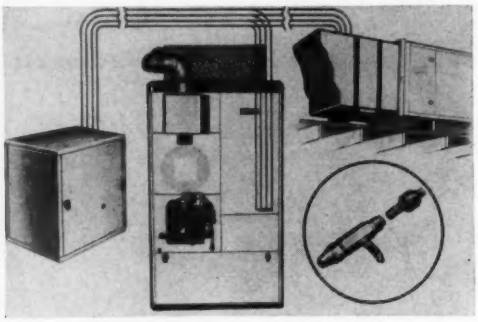
Affiliates { CONCO BUILDING PRODUCTS INC • Brick, Tile, Stone
CONCO MATERIALS HANDLING DIVISION • Cranes, Hoists

## equipment developments *(Continued)*

mounted relay is standard equipment; forward and backward adjustment of the nozzle while burner is in operation is featured. Both models have adjustable floor mountings.

### Air Cooled Remote Systems

COOLING SYSTEMS in 2 and 3 ton capacities with air cooled condensers for remote installation — C. A. Olsen Mfg. Co., Filbert St., Elyria, O. Systems are



charged and sealed at the factory; "herma-seal" refrigeration line coupling maintains the original pressure of the refrigerant charge and retains seal of cooling circuit when the two parts of the split system are connected, according to the company. Cooling coil is installed in year 'round unit or in a duct to a forced air furnace; condensers and compressors are housed in remote cabinet. Circuits utilize dual refrigeration systems with two compressors, condensers and evaporators; both systems are controlled by same thermostat.

### Electric Water Heater

AUTOMATIC electric water heater with molecular bonded glass lining — Pioneer Water Heater Corp., 3131 San Fernando Rd., Los Angeles 65. Improvement features listed by the manufacturer include twin surface mounted immersion type heating elements, anode rod, dual precision thermostatic controls, improved insulation, heat trap water outlet, cold water baffle, high heat limit control and concealed connections. Unit is available in 40 to 80 gal sizes.

### Metals With Embossed Patterns

"SUN-3D-STEEL" embossed metals for products produced for homes, offices and industry — Sun Steel Co., 1702 W. 74th Pl., Chicago 36. Material is available in coil or sheet form in any length and in widths up to 48 in. Pattern shapes the entire cross-section of the metal, providing 25 percent greater strength and rigidity without added weight or cost, according to the company. Metals available are mild steel, stainless


NEW! IMPROVED! GENERAL FUEL OIL FILTERS

Models 1A-25A and 2A-700A Offer These New Features

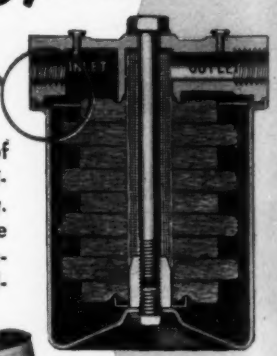
IMPROVED 1A-25A

IMPROVED 2A-700A

DELUXE 2A-300
for big dirty jobs. Depth-type, metal encased cartridge. Exclusive screw-type handle release

1. RESTYLED SEAL IN FILTER CAP PREVENTS LEAKAGE
2. CUPPED RIM IN BOWL FOR EASIER SEALING
3. NEW BUNA GASKET COMPOUND

ABSOLUTELY LEAKPROOF




Won't Clog . . . Won't Crack

Complete restyling of the cap, seal, and gasket of General Filters 1A-25A and 2A-700A *positively eliminates any danger of leakage or improper sealing.* GENERAL'S CUPPED-RIM *all-steel* filter bowl holds the new BUNA gasket securely in place against the redesigned *cast iron* CAP SEAL . . . provides easier sealing . . . lifetime dependability!

CLEAN RIGHT SOOT REMOVER

removes up to ½" layer of soot from any heating plant in 2-5 minutes! Non-corrosive, non-explosive. Made specially for General Filters.

GENERAL FUEL OIL FILTERS
—the ORIGINAL Filter—
Are More Dependable Than Ever!

GENERAL FILTERS, INC.
43800 GRAND RIVER AVENUE • NOVI, MICHIGAN
Canadian General Filters, Ltd. • 39 Crockford Blvd. • (Scarboro) Toronto, Canada

# NEW... "PLUG-IN" ROOM THERMOSTAT

## for year 'round air conditioning

**MOST SIMPLE INSTALLATION EVER!**

Make all connections on mounting base . . . then, simply "plug in" the thermostat.

## IN ADDITION . . .

## *no other thermostat has all these great features!*

- Compact, modern horizontal "New Look" in room thermostats.
- Attractive neutral-colored plastic cover blends with any color scheme.
- Single dial heating and cooling setting simplifies homeowner's operation.
- Penn "heat anticipation" holds heating temperature within one degree of selected level.
- Penn "cold anticipation" assures closer control of cooling temperature and lowest relative humidity.
- Complete flexibility of fan control to meet all design and application conditions.
- Choice of one manual switch for system and one for fan . . . or single manual switch combining both.
- Snap-acting magnet contacts, time-tested on Penn heating and cooling thermostats in over 20 years of field experience.
- Changeover from heating to cooling may be *manual only; automatic only;* or *combination manual and automatic* for homeowner selection according to his needs.
- Seven models available . . . for cooling only; heating and cooling; or heating and two-stage cooling . . . to fulfill all possible air conditioning needs.

Don't settle for less when Penn costs no more! Be sure the packaged air conditioning you sell and install is fully equipped with Penn automatic controls. **Penn Controls, Inc., Goshen, Indiana.**

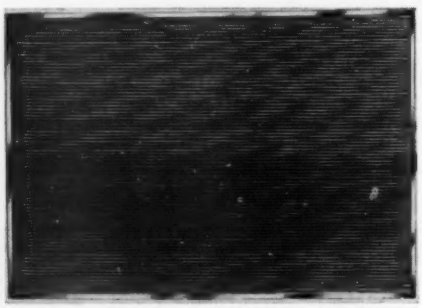
PENN AUTOMATIC CONTROLS

FOR HEATING, REFRIGERATION, AIR CONDITIONING, GAS APPLIANCES, PUMPS, AIR COMPRESSORS, ENGINES

steel and aluminum, thicknesses varying with the metal. Metal can be formed, stamped, crimped, punched, welded, riveted, drilled, sheared or rolled, the company reports. Stucco pattern now available is said to be scratch free, requiring only one finishing coat.

### One Piece Return Air Grille

RETURN AIR grille with one piece assembly for any size opening, designed to eliminate butting together of smaller grilles. — Titus Mfg. Corp., Box 810, Highway 20 West, Waterloo, Ia. Features claimed by the company include curved, hemmed fins which give 80 percent free area, and elimination of "see-through" when used on lower wall areas due to special positioning of fins. Frames are 18 gage cold rolled steel; louvers are 20 gage cold rolled steel spaced on ¾ in. centers, 1 in. deep.

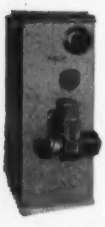


### Packaged Air Conditioners

EIGHT AIR and water cooled store air conditioners in 2, 3, 5 and 7½ ton sizes — Mitchell Mfg. Co., 2525 N. Clybourn Ave., Chicago. Featured are hermetically sealed cooling system; blower section which can be mounted in a variety of ways; plenum chamber which provides for front, side or rear discharge and has a louvered grill with vertical and horizontal adjustments. "Electromagic" filter eye constantly measures filter efficiency and switches on a warning light when the filter must be replaced. Adjustment of a lever converts the unit into a dehumidifier which removes excess moisture from the air without overcooling. Safety features include high and low pressure cutouts and thermal overload switch.

### Pitot Tubes With Direct Reading Chart

PITOT TUBES with inch marks inscribed on both sides for finding centers of duct or making accurate traverse — F. W. Dwyer Mfg. Co., 317 S. Western Ave., Chicago 12. Tubes are of stainless steel with accurately sized and burr-free static holes, the company reports; designed for air velocity or static pressure measure-



MODEL H
80,000 to 150,000 BTU
Wondaire Oil-Fired Hi-Boy

**THE WORLD'S FINEST HEATING**

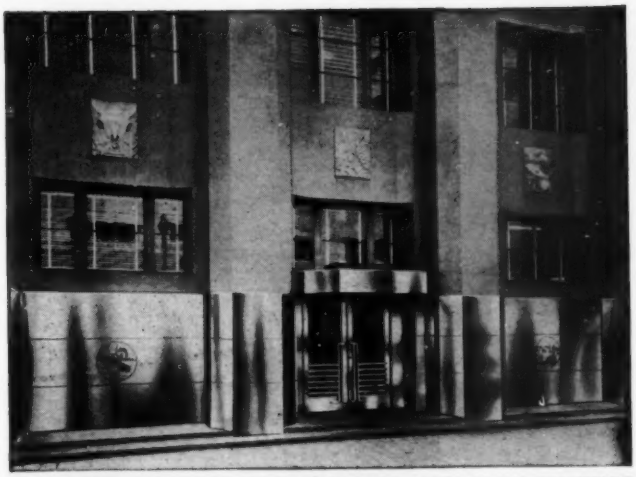
Today's heating prospects are interested in the performance and dependability of their investment. They are interested in heating equipment which offers them the greatest value backed by a guarantee which offers everything that it should. Wondaire heating is becoming a "buy word" for more and more wholesalers and dealers as competition begins to weed out the narrow margin and low performance operators. This is one of the major reasons why more and more heating experts are recognizing and requesting Wondaire Oil or Gas fired heat. Wondaire heating is quality built at prices to please everyone.

**COX MANUFACTURING CO.**
Ridgeville, Indiana

MAIL THIS COUPON NOW!
SEND ME COMPLETE INFORMATION ON—
☐ Horizontal ☐ Model R ☐ Model OCF
☐ Model H ☐ Model CFO
Name .....
Address .....
City & State .....

# Wherever people give a building a beating

## outside



## or inside

# That's the place to use STAINLESS STEEL

**"INFO" for Architects and Builders**

1. "AL Structural Stainless Steels"—12 pages on stainless grades, properties, forms, finishes, standard "specs," uses and advantages.
2. "Stainless Steels for Store Fronts and Building Entrances"—40 pages of valuable data on examples and details. A1A File No. 26D.
3. "Stainless Steel Curtain Walls"—A 24-page progress report on methods. A1A File No. 15-H-1.

*Write for Details*

**Address Dept. AA-66**

You *have* to design for maximum attractiveness in those areas of buildings which have most traffic—such as building fronts, marquees, entrances, lobby details, railings, etc. Yet those same places are exactly the locations where you need maximum utility, too.

What's the *best* material to use? Just remember that stainless steel—and *only* stainless steel—gives you the nearest-to-perfect combination of satiny beauty and rugged toughness. No other material is as good-looking and at the same time as strong, hard-surfaced and resistant to rust or discoloration. No other material requires as little maintenance, cleans as easily and lasts as long.

In short, whether you're considering Allegheny Metal for just the "hard-wear" spots or for an entire curtain-wall design, keep this fact in mind: *no other material costs as little over the long pull as stainless steel.*

Let us give you any information or technical assistance you may require.

***Allegheny Ludlum Steel Corporation, Oliver Bldg., Pittsburgh 22, Pa.***

## Make it BETTER-and LONGER LASTING with Allegheny Metal

TIME-TESTED STAINLESS STEEL

WAD 5209

**Warehouse stocks carried by all Ryerson steel plants**

# Directed Air Flow

for

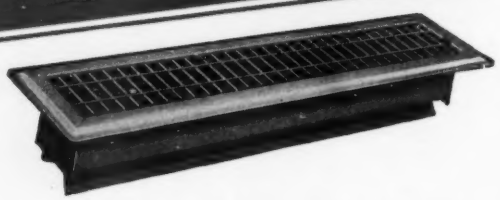
Modern Perimeter Heating

with

INDEPENDENT

"Fabrikated"*

FLOOR REGISTERS



No. 60A—Bars may be set to direct air flow up or to both sides.

● Register faces of the famous "Fabrikated" construction excel in rigidity, open area and attractive appearance. When valves are set in correct position, an adjusting screw permits directing the air flow to the outside wall.

These floor registers are made in seven standard sizes to fit openings 2¼ x 14; also from 4 x 10 to 6 x 14 with free air areas of 29 to 62 square inches. All sizes fully comply with code requirements of N.W.A.H. and A.C.A.

**Write for complete catalog**

***Always Leading — Always Progressing***

*Reg. U. S. Pat. Off.

THE INDEPENDENT REGISTER CO.

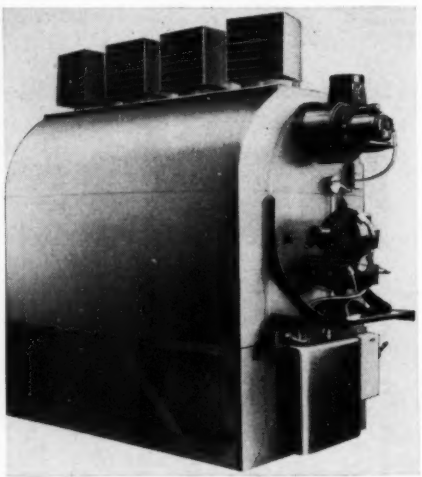
3747 E. 93rd STREET · CLEVELAND, OHIO


## equipment developments *(Continued)*

ment, the units have direct reading chart for air velocities and direct reading curves for elevated temperatures, etc. Length ranges from 12 to 60 in.; integral mounting gland for ½ or ¾ in. thread and split flange for duct mounting are available.

### Direct Fired Space Heaters

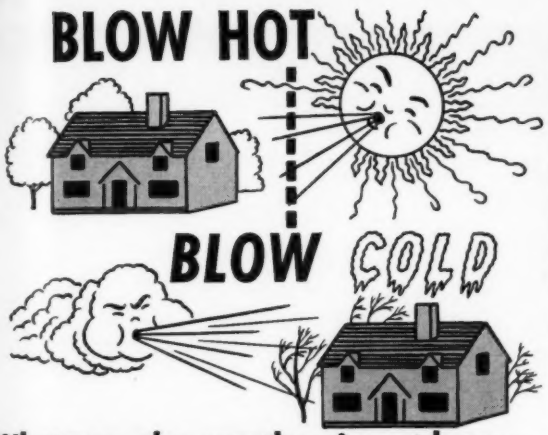
"COMMERCIAL-AIRE" direct fired space heaters for large warm air heating applications, ranging from 30,000 to 2,000,000 Btu bonnet output — Mammoth Furnace Co., 509 Vandalia St., St. Paul 4, Minn. Standard equipment includes direct driven draft inducer, purge timer, purge prover, electronic primary control (all fuels), delayed oil valve for light oil units, combination fan and limit control, line voltage thermostat, disconnect switch, starters for blower motors,



discharge heads, screened air intake, 18 gage casing, 1 in. glass wool insulation with aluminum foil reflector and full fuse protection. Unit fires directly into cylindrical stainless steel primary heating surface; dual rail and guide construction allow for chamber expansion with no stresses, the company reports. Round chamber provides equal distances from crown to burner centerline regardless of unit's position. Larger models have 3 in. hollow shaft supported at the ends by self-aligning pillow block bearings.

### Room Air Conditioners

LINE OF eight room air conditioners in 24 models including a new 1½ hp model which features thermostat control, comfort director grilles and easy filter removal — York Corp., Roosevelt Ave., York, Pa. Suited for installation in transoms, through the wall or in conventional window installations, the 1½ ton unit is hermetically sealed. Also included in the line is a 1/3 hp model for bedrooms, offices and other small rooms, which has conveniently located disposable fil-




Whatever the weather is outdoors—

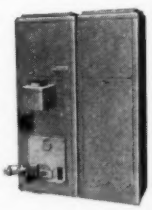
**Majestic**

SUMMER and WINTER

## AIR CONDITIONING

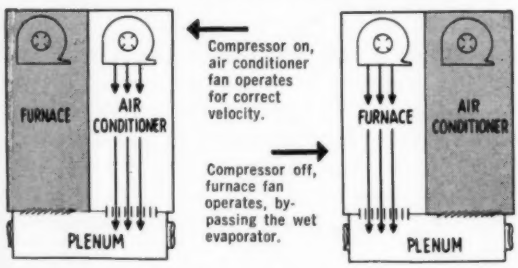
**automatically maintains indoor comfort**

No matter the weather, there's always true comfort indoors with Majestic Air Conditioning—automatically maintained summer and winter without any human contact! Gas or oil furnaces with matching air conditioning units are available in types and sizes for every modern home application. Larger units for schools, churches, and commercial installations are also a part of Majestic's *complete* line.



## Sensational NEW AUTOMATIC CONTROL

**PREVENTS REHUMIDIFYING**




Majestic research has developed a new, fully automatic control for year-around air conditioning systems. It's such an important advancement you'll want full details before installing any other type of equipment.

Among other advantages, it stops rehumidification of room air caused by continuous air circulation over wet evaporator coils during compressor off-cycle. Bypass operation, shown in diagrams, is automatic! EASY TO INSTALL—the most remarkable advantage of this control is *extreme simplicity*. See your distributor or write for details.

**The Majestic Co., Inc.**

394 ERIE STREET, Huntington, Indiana

ANNOUNCING

A New 5-Foot Joint

SUPERIOR

## Spee-D-Lok

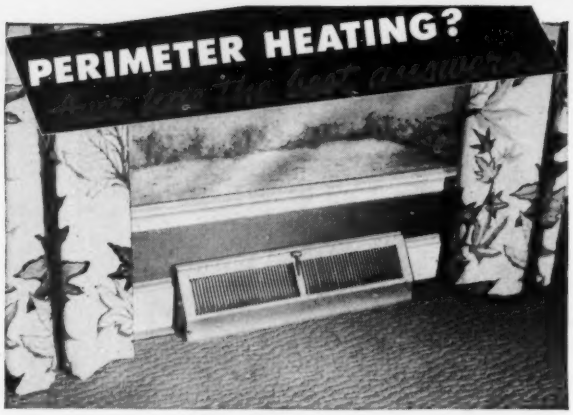
FURNACE PIPE

A COMPLETE LINE OF STANDARDIZED GALVANIZED FITTINGS

● Save your heating contractors still more time, material and money with the new 5-foot length Spee-D-Lok galvanized furnace pipe. The same "tongue-in-groove" locking feature as Superior's popular accepted 2-foot length with the seam running the full 5-foot length of the pipe eliminates tooling and malleting. It's ready for use when they buy it. Just slip the tongue in the groove until it snaps! It cuts without damaging the locking edges. Cartons contain 10 5-foot joints. Superior color gauge system marks every size for quick, easy identification. Write for color chart.

*See Your Wholesaler*
*Write for Our Catalog*

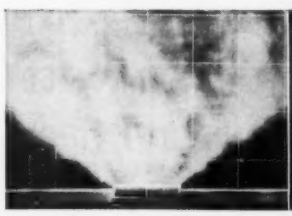
SUPERIOR METAL FABRICATING Company
NILES, OHIO




Auer "Perfusaire"
TRADE-MARK

● The new *low-cost* baseboard decorator style perimeter diffuser illustrated above is only 18" long, but with a capacity of 4 to 8 foot units. Designed for easy installation in or against plastered walls, inside or outside the baseboard and in new or old construction. It has a pre-cut hole for 2¼ x 12" duct openings and knock-outs to accommodate 2¼ x 14" where needed. It is the answer to uneven wall installations—so difficult with long diffusers.

"Perfusaire" distributes air evenly over a wide fan-shaped area, and is equipped with a built-in damper for system balancing. It is an ideal unit for combination heating and cooling systems.

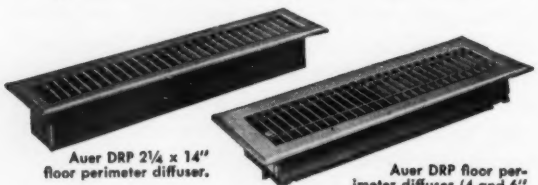


Auer "Perfusaire" test photo showing huge fan-shaped air pattern, ideal for heating and combination heating and cooling systems.

Clip fasteners permit a means of attaching 2¼ x 12" or 2¼ x 14" duct without cutting the diffuser.

FLOOR TYPE

For floor type perimeter and intricate "narrow-space" installations, Auer can fill your needs from its complete "DRP" line of registers in standard sizes.



Auer DRP 2¼ x 14" floor perimeter diffuser.

Auer DRP floor perimeter diffuser (4 and 6" widths, 10, 12 and 14" lengths).

*Write for full details on low cost "Perfusaire" and other perimeter diffusers. Ask for Bulletin P-54.*

Auer REGISTERS and GRILLES

THE AUER REGISTER CO.

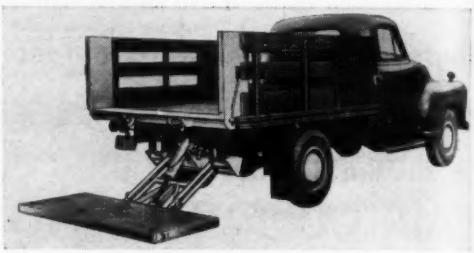
6602 Clement Ave. • Cleveland 5, Ohio


## equipment developments *(Continued)*

ters. A ½ hp model is in standard and deluxe series. The ¾ hp conditioners are in 12 models including two consoles and 10 window units. Eight 1 hp units are comprised of six window units and two consoles.

### Lift Gate for Trucks

MODEL 144 lift gate with 1000 lb lifting capacity, designed for ¾ and 1 ton stake and van trucks — Anthony Co., Streator, Ill. Lightweight hydraulic elevating



tailgate also mounts on larger trucks. Platform is manual-spring closed and is available in ramp, square or general purpose styles. Unit has same design and safety features as larger models.

### Power Room Exhausters

TYPES E, N and W axial power room exhausters with squat mushroom type head for low 2 ft silhouette — Chicago Blower Corp., 9867 Pacific Ave., Franklin Park, Ill. Exhausters are furnished with three types of blades: type "E" wheels are designed for large volume and low static pressure; types "N" and "W" wheels are axial airfoil type for higher static pressure. Ball shaped air deflector is welded to the inside of the head to split and control the air flow. Units are furnished in direct or V-belt drive and in special metals. Motors are ball bearing type, enclosed and mounted in the air stream. V-belt fans are supplied below 860 rpm. Designed for industrial and commercial applications where a moderate noise level is of minor importance, units can also function as fresh air supply units. Volumes range from 870 to 41,500 cfm; static pressures are from ⅛ to 1½ in.; blade diameters are 14 to 48 in.

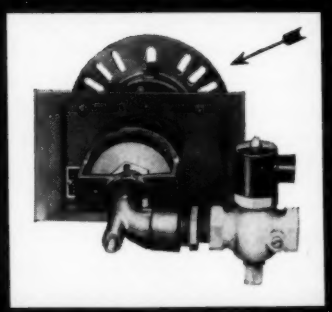
### Residential Air Conditioner

"TEMTRON" residential evaporative air conditioner with two ¾ hp compressors said to provide 3 tons of refrigeration — Ultrasonic Corp., 640 Memorial Dr., Cambridge, Mass. Unit offers automatic two stage operation for more constant temperature, the company states. Second compressor automatically assists in rapid cooling when indoor temperature varies more than 2 deg from the thermostat setting; when cooling load is

# When ordinary burners won't fit...

TESTED AND LISTED

## ADAMS Inshot GAS CONVERSION BURNERS



Easiest to install and service! Specially designed to convert oil-fired furnaces and boilers to automatic gas heat. Furnished complete with all necessary controls. Operates dependably on all gases including LP.

Model 4H features burner tube only 7" long, 4¼" diameter for installation where most other burners will not fit. Plate size, 6¼" x 10". Max. capacity, 180,000 BTU per hr.

Model 6H has burner tube 7" long, 6" diameter. Plate size 14" x 24". Max. capacity 400,000 BTU per hr.

*Both burners guaranteed by 36-month factory warranty.*

A universal cast iron mounting flange is available with Model 4H only (see arrow) for application where the burner tube does not project its entire length into the heating unit. This flange replaces almost any oil burner mounting flange.

*Best by Heat Test*

***Ask Your Jobber TODAY or Write for Specifications and Prices!***

**ADAMS Manufacturing Company**

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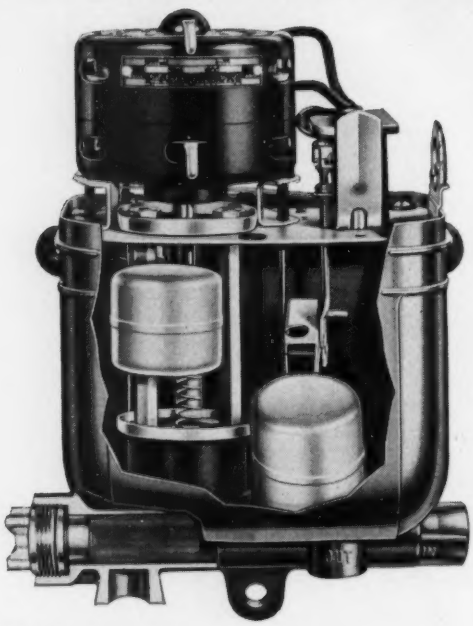
# BIG LIFT

## for heating plants with a remote tank



Only Model 356

## OILIFTER

### offers your customers all these features

Oilifter lifts fuel oil from basement or remote storage tank — to the first floor, second floor, or *as much as 25 feet away from heating appliance.* Feeds and keeps one or more oil burning appliances supplied at all times. Operates *automatically!* Check these additional features:

- **Complete freedom from fuel handling and spillage** — no waste.
- **Simple to operate** — Turn on at beginning of season—no further attention. No radio or TV hum.
- **Pumps No. 1 or 2 fuel oil** — 3 gph at 25 ft. lift and 4½ gph at 10 ft. lift.
- **Simple to install** — Mounts with 3 screws. Only one ¼" O.D. copper tube needed.
- **No overflow** — Safety float protects against overflow. Built-in strainer traps dirt.
- **Listed by Underwriters' Laboratories** — Guaranteed by A-P Controls Corporation.

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DEPENDABLE *Controls*

**A-P CONTROLS CORPORATION**

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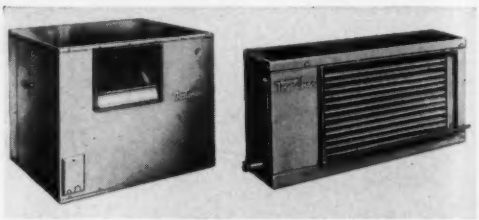
*For Export:* 13 E. 40th Street, New York 16, N. Y., U.S.A.


## *equipment developments* (Continued)

light, only one compressor operates. Split operation maintains humidity at a lower level. Unit operates on 220 to 240 volt, single phase power supply, uses 13 gph of water; water requirements are supplied by ¼ in. tubing attached to the household water supply.

### *Air Cooled Air Conditioners*

LINE OF air cooled summer cooling units in three models with condensing units of 2, 3 and 5 hp and cooling coils of 2, 3 and 5 tons — Thatcher Furnace Co., Centre St., Garwood, N.J. Remote condenser is connected with direct expansion cooling coil by copper



tubing. Coil can be set nearly anyplace in the air supply system. Unit consits of four row copper tubing condenser coil; gas cooled, hermetically sealed motor-compressor; welded steel receiver and continuous duty blower. Cooling coil is flanged on both sides for connection to ductwork.

### *Bench Punch Press*

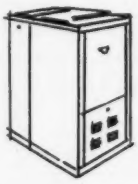
MODEL B-2, 2 ton power bench type punch press designed for small stampings or mass production with capacity up to 200 operations per minute — Alva Allen Industries, 1001-1015 N. 3rd St., Clinton, Mo. According to the manufacturer, the press offers quick action, single pin clutch with repeat or non-repeat action; straight ram guides with flat gib; accurate adjustment with positive lock; large die space for stamping, forming, drawing, cutting, riveting, blanking and other operations. Weight is 105 lb; standard stroke is ¾ in., with ¼ to 1¼ in. optional. Power source is 1/3 hp motor with direct V-belt drive.

### *Insulated Gas Vent Pipe*

"RV METALBESTOS" double wall insulated gas vent pipe — William Wallace Co., Belmont, Calif. Complete venting system with assortment of round fittings designed for safe, correct venting of gas appliances is said to resist denting and cut waste. "Rota-Lock" coupler permits simple, positive locking. Rugged steel outer pipe protects thin aluminum inner pipe. Insulating air space keeps inner pipe hot and outer pipe cool. Strong venting draft is created; fire hazards from overheating adjacent surfaces are eliminated and fast

# Why Armstrong dealers make money

Armstrong dealers have no inventory problems — no necessity for heavy inventory investment — no waiting for long-distance shipment when they need a furnace or a summer air conditioner in a hurry. Their nearby Armstrong wholesalers carry a heavy inventory for them and deliver in a hurry. That means money for operation, not money boxed up in your warehouse.



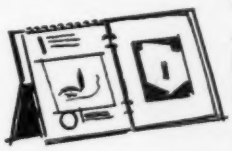
Installation time cost is at a minimum, because small units are shipped assembled, and others are designed to be easily assembled on the job. These two advantages alone, no inventory problem and minimum installation time, mean an Armstrong dealer is ideally set-up for either new house or replacement furnace work.

Precision of design and construction insures units which will require few if any of those costly call-backs which drain the profit barrel.

You never have to struggle to sell a unit which isn't ideal for the heating or cooling need; among Armstrong's 56 basic models and sizes of furnaces, and 12 of summer air conditioners, is one (or a pair) to do the job *right.*

56+12

And every one of them includes features, many exclusive, which help you sell at a profit against the professional price-cutter. The most successful merchandising aid ever produced by the industry, Armstrong's Visualizer, helps you pound home those features.



More sales power: The Armstrong line of furnaces and summer air conditioners is the only one which has been awarded the Parents' Magazine Seal of Commendation and is also accepted for advertising in Today's Health, published by the American Medical Association.

To make sure that you can cash in on all those advantages, Armstrong has this year put together another powerful national advertising campaign, and backed it with by far the most complete program of dealer promotion in the history of the company. Yes, the keystone of the Armstrong '55 program is dealer profit — *net* profit.

And we can prove it. It deals with *your* problems. It's organized. It's not a hit-or-miss proposition. It's as easy to understand as ABC. It will show you why Armstrong is "the company with get-up-and-go."

If you want to know what can be done to help *you* make money, call your nearby Armstrong wholesaler *now.* He'll lay the Armstrong plan proudly in front of you.

ARMSTRONG FURNACE COMPANY

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COMMENDED BY THE CONSUMERS SERVICE BUREAU OF PARENTS' MAGAZINE

ARMSTRONG FURNACE

COLUMBUS, OHIO COMPANY DES MOINES, IOWA

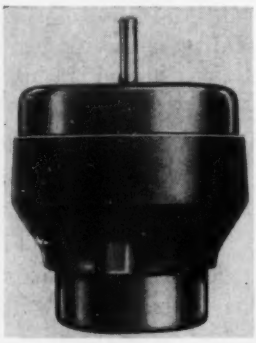
## equipment developments

*(Continued)*

carry-off of vent gases is provided, the company states. Series is available in 3 to 6 in. sizes.

### Shaded Pole Motor

SP-25 FOUR POLE, shaded pole motor designed for evaporative cooler pumps, auxiliary fans and draft booster applications — Electric Motors & Specialties,



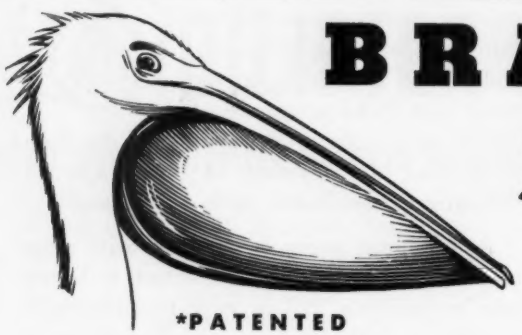
Inc., King and Hamsher Sts., Garrett, Ind. Rated at 1/60 to 1/30 hp, motors operate between 900 and 1550 rpm at rated input of 115 volt alternating current. Unit can be operated vertically or horizontally; three standard frames with double or single shaft extensions increase versatility. Main features are unit bearing construction and lubrication system comprised of thermally isolated lubricant reservoir of 50 cc of special oil, and self-contained circulation system. Cool lubricant is pumped through bearing at 4 to 10 drops per minute, then returned to reservoir where it is filtered and cooled for recirculation. Absence of metal-to-metal contact between shaft and bearing reduces friction.

### Slip Joint Duct Fittings

GALVANIZED lock joint for furnace duct and fittings in 5 ft length with "vanishing" crimp — Superior Metal Fabricating Co., Pleasant Ave., Niles, O. Tongue-in-groove locking feature is same as the company's 2 ft model, eliminating tooling and malleting for the entire 5 ft length, the manufacturer reports. Cutting is said not to damage the locking edges.

### Oil Fired Duct Heater

OIL FIRED duct heater in five sizes ranging from 110,000 to 220,000 Btuh output — Certified Furnace Corp., P.O. Box 1059, Trenton 8, N.J. Heaters can be teamed in tandem for higher output. Applications are: 1) to provide direct heater working in conjunction with remote air cooling unit when air moving blower is part of the air conditioning system; and 2) as a makeup

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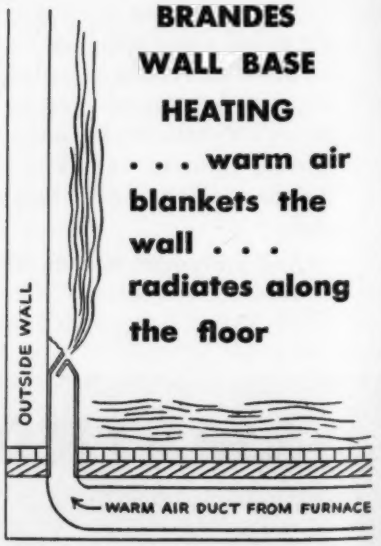
WALL BASE HEATING

No matter what your pocketbook can stand, Brandes can solve your problem. Three distinct lines and a total of fourteen different sizes to choose from makes Brandes Wall Base Heating the most complete line on the market today. With Brandes wall base heating you get the ultimate in beauty and performance . . . at reasonable prices, too!

THE BRANDES COMPANY

2046 Winnebago Street, Madison 4, Wisconsin

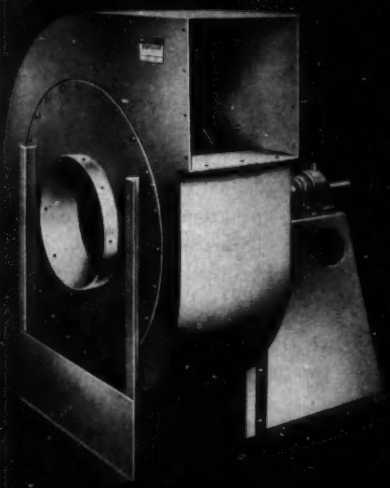
*Write for Catalog*



# Fact:

## Westinghouse Industrial Fans Do All These Jobs Better . . .

1. Handle air, exhaust fumes, gases, smoke
2. Remove metal dust, chips, sawdust, grains
3. Convey long fibrous materials



STURTEVANT INDUSTRIAL FANS

In four standard arrangements for integral or separate motor drive, belted or direct-connected. Smaller sizes available with corrosion resisting cast iron casing.

FOR EXHAUST AND CIRCULATION

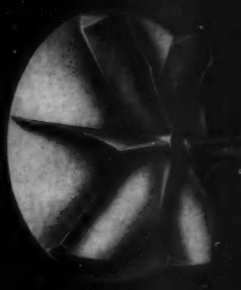
Select the efficient Air Handling Wheel for smoke, fumes, gases or light dusts; for oven circulation, heat treating, process and product cooling. Uses smaller motors.

FOR MATERIAL HANDLING

Select the Material Handling Wheel, especially designed for exhausting, grinding and buffing wheels; conveying granular materials, chips and sawdust.

FOR STRINGY MATERIALS

Select the Long Shaving Wheel, especially designed for long, stringy, fibrous materials which must pass through the fan.



**Choose a Westinghouse fan, whether you're looking for performance, rugged construction, or prompt delivery.**

For fume exhaust, sawdust removal, or material conveying, there's a Westinghouse fan to fit your most exacting requirements. Any of four basic fan arrangements, plus a choice of three wheel types will provide the answer to your specific problem.

**MORE FACTS?** Call your nearest Westinghouse-Sturtevant Sales Engineer . . . he's the "Man with the Facts" on heating, air handling, and electronic air cleaning . . . or fill in the coupon below.

## WESTINGHOUSE AIR HANDLING

YOU CAN BE SURE...IF IT'S

Westinghouse

J-80445

Westinghouse Electric Corporation
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Hyde Park, Boston 36, Mass.

*Please send more facts on Industrial Fans.*

NAME AND TITLE .....

COMPANY .....

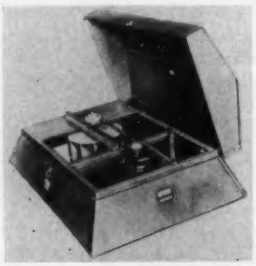
CITY ..... STATE .....

## equipment developments *(Continued)*

fresh air heater in foundries and industrial buildings. Exhaust flue outlets are at both ends of the unit. Service access for controls is at the side.

### Power Roof Exhauster

"AIRMPELER BCB" lowboy model power roof exhauster with side mounted motor and backward curved centrifugal wheel — C. L. Ammerman Co., 104 N. 2nd



St., Minneapolis, Minn. Unit moves 13,250 cfm, measures 20 in. from top of curb to top of motor cover. Other units in the line range in capacities from 160 to 47,000 cfm with direct drive optional. Other features include full venturi inlet, rigid motor support, top and lower bearings on wheel shaft and low wind resistance.

### Glass Lined Water Heaters

MODELS PG 720, PG 730 and PG 740 water heaters in 20, 30 and 40 gal models with elastic all-porcelain lining — Perfection Industries, Inc., 7609 Platt Ave., Cleveland 4, O. All models feature 100 percent safety control with snap-action thermostat, the company states. Top, sides and combustion chamber walls are blanketed with a layer of glass fiber insulation; anti-syphon inlet directs cold water to bottom of the tank.

### Residential Ventilating Fans

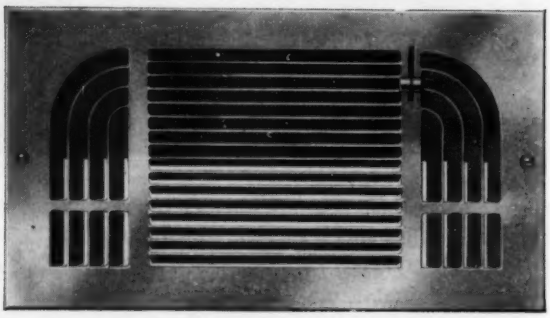
LINE OF ventilating fans designed for quiet performance in kitchens, bathrooms laundry and play rooms — Miami Cabinet Div., Philip Carey Mfg. Co., Cincinnati 15, O. Features are snap-on propeller and motor assembly, one piece grill, neoprene grommet mounted to reduce vibration and weather sealed louver; fans are in 8 or 10 in. models in chrome or white enamel grilles. Ten models for wall, through ceiling or combination wall and ceiling are available.

### Portable Welder

"LINCWELDER 100" 100 amp a-c welder designed for many applications in the sheet metal industry —Lincoln Electric Co., 22801 St. Clair Ave., Cleveland 17, O. Portable welder has 100 amp capacity and can be operated on a standard 110 or 220 volt circuit


# Give your heating installations *"eye appeal"* with the new RAINBOW wall diffuser

**By popular demand we have developed this new design for use on either high or low velocity perimeter installations**



**AVAILABLE FOR IMMEDIATE DELIVERY AT NEW LOW LIST PRICE**
**Order with or without valve for wall, baseboard or out-of-wall installations.**

**SIZES—10, 12, 14 x 4"**
**10, 12, 14 x 6"**

***Ask your jobber for complete details and prices or write direct to:***

**THE A & A REGISTER COMPANY**
8327 CLINTON RD. CLEVELAND 9, OHIO

# TWINS!

## WHY NOT?

...when adding cooling to heating can double your market

...when Economy provides everything you need for cooling and heating every home

...when—best of all—Economy "cool air" units install as easy as warm air!

**WARM AIR—COOL AIR**

Now — International Economy makes it easy for you to get into the growing summer air conditioning business in a big — and profitable — way! In the complete new Economy line of Summer Air Conditioners you'll find everything you need to solve all your customers' cooling problems. Units for *air-cooling* and *water-cooling* from 1½ H.P. to 3 H.P. — including Hi-Boys for matched installations with furnaces; horizontal furnaces for crawl-spaces and basements, and air-cooled split systems for any home.

### INSTALLATION IS SIMPLE

You don't have to go to school or take special courses to sell and install Economy Summer Air Conditioners. They're no more complicated — require no more skill than warm air systems — and you're already an expert at that.

### And you don't have to play "nursemaid"

Refrigeration mechanisms for the units are the full-welded Hermetic types — following engineering principles used in millions of household refrigerators that give continuous service for 15 years and more without attention! There are no valves, fittings, screws or gaskets requiring maintenance. Lubrication is permanent. Just install the unit and forget it!

Write for full facts today.

### COMPARE these International ECONOMY features

- **Five-Year Warranty on Entire Sealed Refrigeration System**
- **Air Cooled or Water Cooled to go with Hi-Boys, Lo-Boys, Counterflos, Horizontal Furnaces**
- **Completely Wired Control Panels**
- **Permanent Lubrication**

**International HEATER COMPANY**

**UTICA 2, NEW YORK**

CONNOR
ENGINEERING CORPORATION

kno·draft®
adjustable air diffusers

QUICK
INSTALLATION
QUICK
APPROVALS

Kno-Draft *Adjustable* Air Diffusers are so mechanically simple that you can install them in just about half the ordinary time and get your job approvals that much faster. Kno-Draft Diffusers also save you time in figuring your jobs—because they are completely adjustable *after* installation.

**1. CUT TIME** for installation in half. Simply attach outer cone to duct, then fasten pre-assembled diffuser unit to three suspension bolts.

**2. ADJUST AIR DIRECTION** *after* installation with just a few screwdriver turns. Discharge can be at any desired angle, from horizontal to vertical.

**3. BALANCING** the system is easy. The single annular air stream from a Kno-Draft Diffuser permits direct volumetric readings.

**4. VOLUME OF AIR** is adjusted by a simple twist of the wrist. Just turn the central operating screw to set the damper for any desired volume.

For full information, send for the Kno-Draft Data Book. Connor Engineering Corporation, Danbury, Connecticut.

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Please send copy of your 32-page Kno-Draft Data Book.

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Street_____

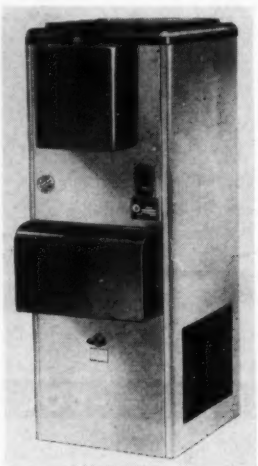
City_____ Zone____ State_____

## equipment developments *(Continued)*

fused for 30 amp. Unit is suitable for a variety of welding applications including installation of metal roof deck and its braces and supports.

### Gas Fired Furnaces

MODELS GC3-80 (counterflow) and GH-3-80 (highboy) gas fired furnace — Thermo-Products, Inc., North Judson, Ind. Counterflow unit is arranged for filters on either side or top; highboy provides for filters on either side or bottom. Filters are replaced through blower access door. Ribbon burner features 100 percent safety pilot shutoff on all gases, the company reports.



### Reversed Cycle System

REVERSED CYCLE dual room air conditioning units in ¾ and 1 hp capacity, employing piston operated compressors for heating as well as cooling — Carrier Corp., 300 S. Geddes St., Syracuse 1. Designed for mild winter temperatures or for between season use, unit uses a common grille and casing permitting installation in 14 different ways. Unit is switched from cooling to heating by a control device which reverses direction in which heat is moved by the refrigerating system. Heat is taken from room air by refrigerant circulating through a cooling coil; refrigerant vaporizes when it absorbs this heat, then goes to the compressor. Temperature of refrigerant vapor is raised by mechanical compression.

### Self-Adjusting V-Belt

"QVD" SELF-ADJUSTING V-belt with built in "watchman" designed to automatically adjust tension level to eliminate vibration noises caused by tight belts — Dayton Rubber Co., 2342 W. Riverview Ave., Dayton 1, O. Belt is 17/32 in. wide and 9/32 in. thick with 40 deg V angle; neutral axis is engineered to minimize vibration and electronically tested, the manufacturer

# Comfort AND Alen EVAPORATIVE COOLERS

# Twins

✓ IN QUALITY ✓ PERFORMANCE ✓ DURABILITY ✓ COOLING COMFORT
✓ LOW INITIAL COST ✓ LOW INSTALLATION AND MAINTENANCE

The **FINEST** COOLING OPERATION With **LOWEST** OPERATING COST!

SEND FOR COMPLETE DETAILS ON THESE FINE COOLERS TODAY!

SPRAY-WHEEL TYPE
## AIR-WASHER
Offers exact guaranteed cooling efficiency.

DRIP-PAD TYPE
## EVAPORATIVE COOLER
Available in all standard capacities to meet every cooling requirement.

**SPECIAL FEATURES:**

- Flinger wheel does proper job of water atomizing
- Z-pad engineering design means cooler, filtered air always
- Pads rest on drain shelf which prevents return of water to lower pads (gives correct moisture content to entire pad area)
- Blower standard-frame motor equipped with variable-pitch pulley

*Comfort* and *Alen* Evaporative Cooler Cabinets of hot-dipped galvanized sheet metal

INTERIORS: entirely treated with etching type Zinc Chromate primer plus a coating of black, water-proof rust-resistant Mastic baked on. Areas constantly subjected to moisture specially treated for long life. Interior working parts treated with new, longer-life, rust and corrosion-resistant, vinylplastic finish baked on (found only in Alen and Comfort Coolers).

*Manufactured and Distributed By*

**Comfort PRODUCTS CORPORATION**

1705 SOUTH LAMAR STREET — DALLAS 2, TEXAS

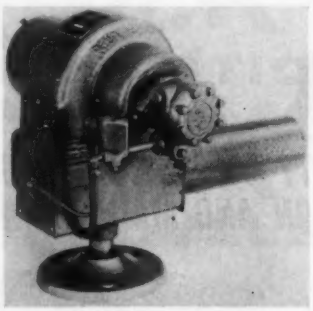
THE PIONEER IN AIR COOLING WITH SPRAY-WHEEL TYPE AIR-WASHER EVAPORATIVE COOLERS

## equipment developments *(Continued)*

reports. The belt is made of a blend of synthetic rubber and fabric.

### Oil Burners

TYPES KA-SH and KA-1-SH oil burners with delayed action oil valves designed for positive cutoff and smoke elimination — Quiet Automatic Burner Corp., 33-35



Bloomfield Ave., Newark 4, N.J. Adjustment is mounted in recessed mounting plate; burner and fan blades also are accessible from the rear without removing blower wheel. Type KA-SH has capacity from ¾ to 2 gph; KA-1-SH has up to 6 gal capacity.

### Clog-Resistant Vacuum Cleaner

FURNACE VACUUM cleaner with "Never-Clog" secondary filter said to be clog resistant — Pullman Vacuum Cleaner Corp., 33 Allerton St., Boston 19. Cleaner is guaranteed by the company to resist soot, soot acids, alkalies, rot, mildew and fire. Complete cleaner attachments are also available in the manufacturer's new vacuum cleaner kit.

### Coated Electrode

"EASYARC" LH 7-16 electrode designed to produce better stretch and toughness characteristics in welds — Air Reduction Sales Co., 60 E. 42nd St., New York 17. Three features are concentrated arc energy, powdered iron coating which melts to become part of the weld, and heavy coating designed to help control arc action and allow higher currents to be used safely.

### Fuel Oil Filter

MODEL PK-150 fuel oil filter for use with furnaces and small central heating plants — Klemm Products Div., Klemm Automotive Products Co., 1718 N. Damen Ave., Chicago. Rated at 150,000 Btu, the filter can be used with no. 1 or no. 2 fuel oil and with either pressure or gravity type burners; micronic filtering element is said to trap water and remove dust, rust and scale down to 10 to 20 microns. Unit has metal bowl, chrome plated casting; other components are brushed zinc.


# Announcing the New "JET-8"

## GAS CONVERSION BURNER

Make this your BANNER YEAR for profits, with Banner's new "Jet-8" Gas Conversion Burner. Many new features help you step up sales and increase dollar volume:

*1-Piece Cast Iron Burner Head* — The upright posts supporting the flame spreader give best mixture of secondary air and gas mixture for perfect combustion.

*Telescoping Venturi* — gives you a burner that fits the shortest — or longest — furnaces and boilers.

*Minneapolis-Honeywell Powerpile Controls.*

*Input* — 80,000 to 200,000 B.T.U.

*Silent Operation.*

*Competitively priced* — for more Dealer Profit.

Write today for complete information and prices.

**BANNER BURNER COMPANY**

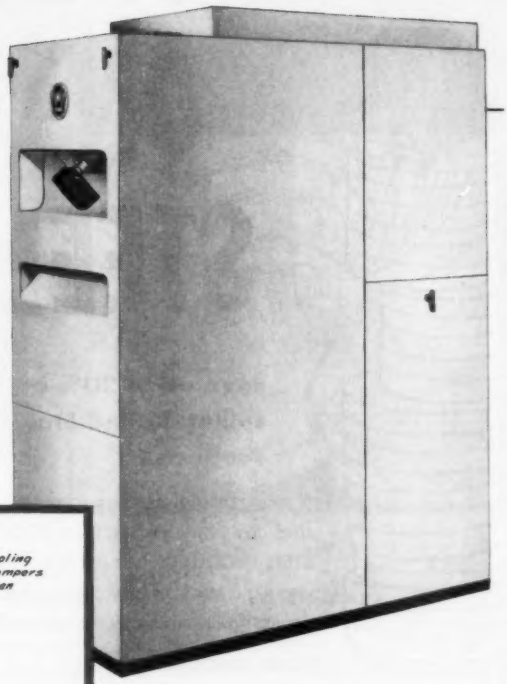
**227 E. INDIANOLA AVE. • YOUNGSTOWN, OHIO**

For as little as 5% increase in home owner's cost

# CONCO *Contemporary*

## "COOLATER" CABINETS

provide engineered space for complete cooling unit

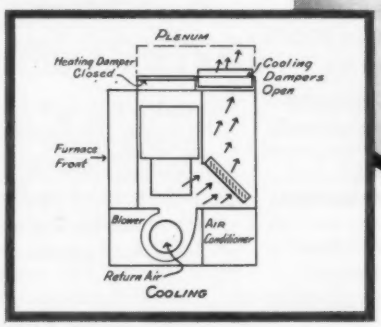


**A new concept of Heating-Cooling Design**

Now at just a trifling cost, your heating installations can include the *space* for cooling. At negligible cost the Conco Contemporaries provide this space as an integral, *engineered* part of the cabinet. Add cooling any time without change in cabinet, furnace or ducts. Home owners want this feature. Provide it even on budget priced installations with Conco Contemporaries, today's most modern home conditioners—decorative, compact, gleaming white. Write for complete specifications. Here is an important plus feature that gives you a big sales advantage at pin-money cost.

**BELOW:** Detail shows how cooling space in furnace at right is engineered for effective blower use.

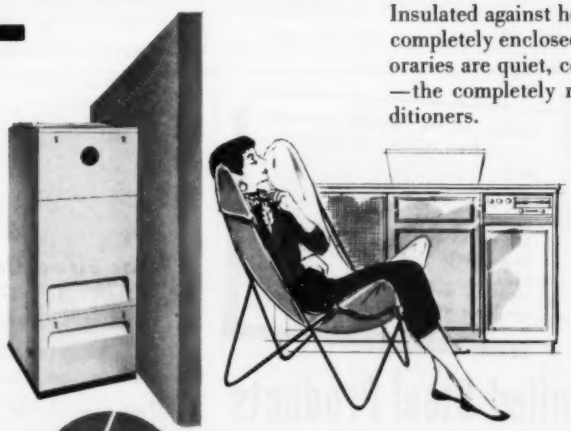
Counterflow Furnace with space for cooling at the bottom — an engineered, integrated design. Capacities 56,800, 75,000 and 90,000 BTU output. Cooling capacities, 2 and 3 tons.




***the quiet line***

Insulated against heat and sound, and completely enclosed, Conco Contemporaries are quiet, compact, decorative —the completely modern home conditioners.

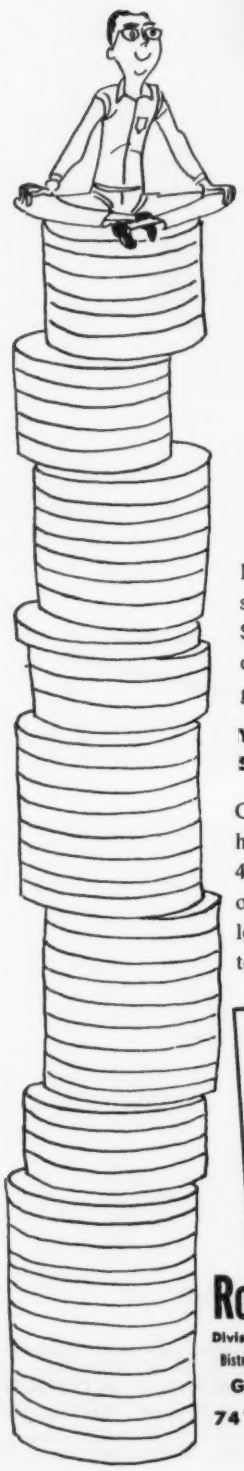
Low Hi-Boy Furnace, 56,800, 75,000 and 90,000 BTU output. Note deluxe cabinet extension available for use as return air channel to give smart horizontal lines preferred for basement installations.



CONCO heat Ranchief Town & Country

**CONCO ENGINEERING WORKS**
Division of H. D. Conkey & Company, Mendota, Ill.
Affiliates: CONCO BUILDING PRODUCTS INC. - Brick, Tile, Stone
CONCO MATERIAL HANDLING DIV. - Cranes, Hoists

# SAVE MONEY ON STEEL



**save up to 20% by calling Rolled Steel Products!**

Make tremendous savings on all steel costs by ordering from ROLLED STEEL PRODUCTS. We carry a complete stock of sizes, types and gauges for all manufacturing needs.

**YOUR UNCONDITIONAL SATISFACTION IS GUARANTEED!**

Call us collect today and find out how we can help you cut costs 4,020 firms have already found that our fast, dependable service plus our low, low prices are the sure way to big savings on steel.

Typical of the MONEY SAVING values from ROLLED STEEL PRODUCTS.

10 thru 22 gauge galvanized sheets, on size and gauge to a lift, full sheets, non-standard sizes, $6.45 CWT, F.O.B. Skokie, Illinois.

Standard size sheets in all gauges available at slightly higher prices.

**Rolled Steel Products**

Division of Emergency Steel Service Corporation

Distributors of: SHEETS—PLATES—BARS—STRUCTURALS—STRIP

GENERAL OFFICES & WAREHOUSE

7415 St. Louis Ave. Skokie, Illinois

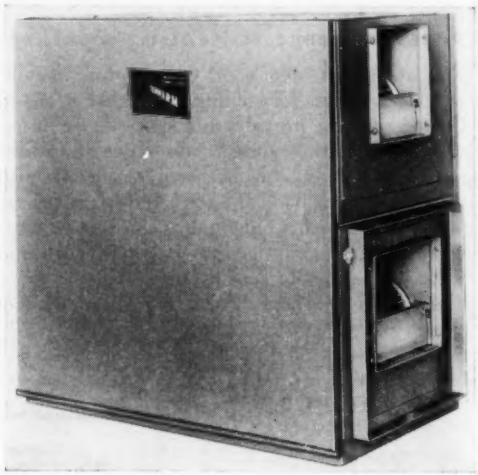
ORchard 3-7400


## equipment developments *(Continued)*

Replaceable filter measures 4 in. high, 2¼ in. in diameter and has ¼ in. opening. Element is removable without tools.

### Residential Air Conditioner

MODEL SAC-3 air conditioning unit with condenser coil placed below the cooling coil — Sunwarm, Inc., P.O. Box 263, Kingsport, Tenn. Condensate from the cooling coil flows down over the condenser; inlet and



outlet locations of the evaporator air are variable, making possible five different combination locations. Zone selector which divides the house into two separate zones is optional. The 1½ ton unit uses a non-toxic refrigerant and has a built-in safety system, the company reports.

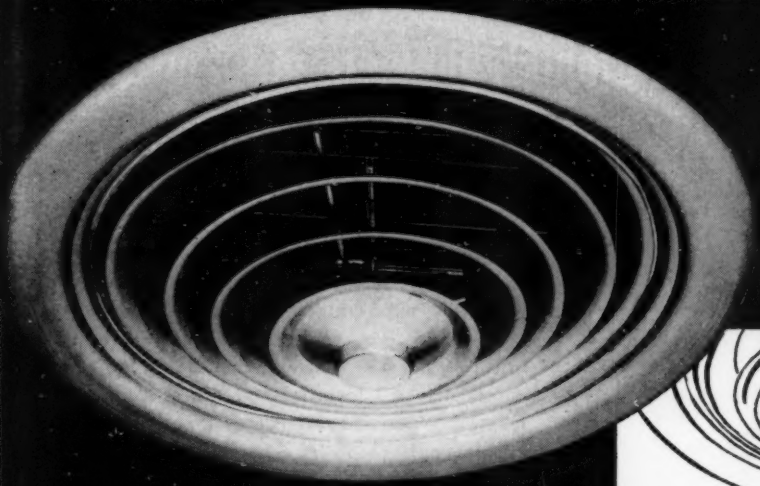
### Activated Charcoal Filter

"ODOR-STOP" air conditioner filter which combines activated charcoal and glass fiber to cleanse the air of smog irritants and filter dust and pollen — Philco Corp., Tioga and C Sts., Philadelphia 34. The unit is also designed to absorb unpleasant odors. Filter is supplied as standard equipment on the company's room air conditioners.

### Gas Fired Unit Heater

CEILING SUSPENDED, downward discharge unit heater rated at 430,000 Btuh input — L. J. Wing Mfg. Co., 306 Vreeland Mills Rd., Linden, N. J. Combustion chamber and heat exchanger are 16 gage aluminized steel welded into one-piece assembly; burners are heavy wall cast iron. Built-in draft diverter is designed to insure proper burner operation under abnormal conditions of back draft. Automatic safety controls are provided; heaters are equipped with discharge outlets to suit the installation requirements of ceiling

# MORE ECONOMICAL TO BUY AND INSTALL



# FLEXIFLO

## THE DIFFUSER WITH A BUILT-IN VOLUME CONTROL

Flexiflo adjustable air diffusers reduce installation costs by providing for rapid, easy adjustment of air volume *and* air pattern after installation.

Not only the air volume but also the diffusion pattern is controlled by one knob. Just a half turn and the push-pull action changes the relative position of the blades, thus providing the desired results instantaneously. Because the system is so easily balanced, installation costs are reduced.

Engineering is also simplified, since the Flexiflo's wide range of adjustability minimizes the need for specifying exact performance characteristics.

Another advantage of the Flexiflo diffuser is its provision for uniform air distribution by means of *built-in equalizing deflectors* which are also easily adjustable after installation.

The result is a combination of draftless diffusion with efficient, trouble free operation.

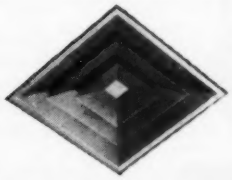
*A complete line of Flexiflo diffusers for every cooling, ventilating and heating need is made in 12-standard sizes, up to a capacity of 12,000 CFM.*

**TYPE R — FOR COOLING**

Air travels in a constant pattern parallel to the ceiling regardless of any adjustment in air volume.

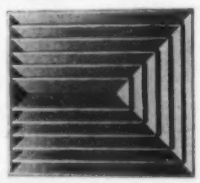
**TYPE V — FOR COOLING AND HEATING**

Air diffusion pattern and volume are fully adjustable, after installation, for any conditions, supplying air at any angle.



**TYPE H—SQUARE**

Fully adjustable square diffusers and fixed rectangular 2, 3, and 4 way diffusers.



**TYPE MP— RECTANGULAR**

For one, two, three or four-way diffusion, 16 styles, hundreds of sizes to accommodate any shaped area.

*Write for the catalog containing complete technical data on the Flexiflo line of diffusers.*

FLEXIFLO

**UNIVERSAL DIFFUSER CORP.**

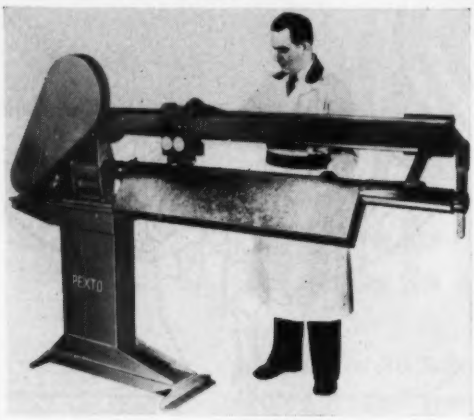
1350 GARRISON AVENUE • NEW YORK 59, N. Y.

## equipment developments *(Continued)*

height and floor area. Revolving outlets send the heat downward in slow moving air stream that covers entire working area, according to the company.

### Lateral Seam Closer

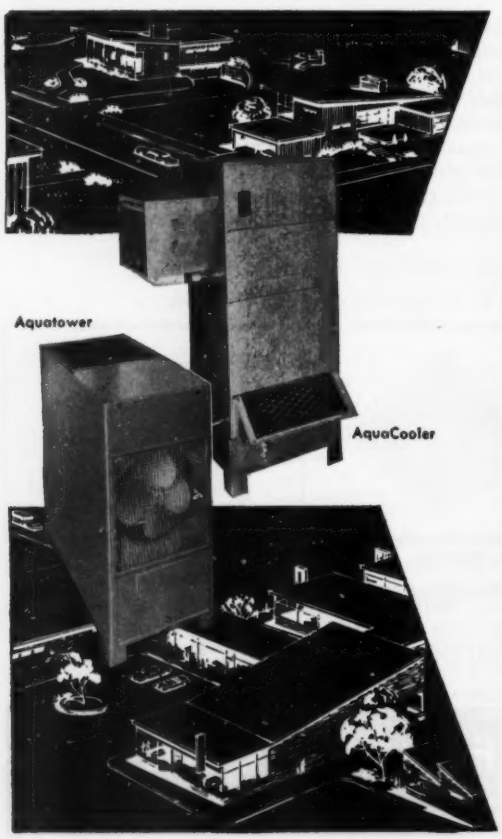
LATERAL SEAM closer with single all purpose horn designed to form accurate, tight seams in flat or round ducts — Peck, Stow & Wilcox Co., Center St., South-




ington, Conn. Unit is powered by 1½ hp, 1800 rpm motor with magnetic starter, connected by V-belt drive with an endless roller chain, actuating the carriage with a speed of 100 fpm. Horn is designed with five separate working faces to pre-form the finish inside and outside seams and on Pittsburgh locks. Horn is secured in any of its five working positions by a single screw adjustment. Machine is quiet and neat because noise and marks of hammering are eliminated, the company states.

### Thermostat with Single Selector

MODEL T-231 thermostat with single selector switch for year 'round air conditioning — General Controls Co., 801 Allen Ave., Glendale 1, Calif. Unit has separate roll type temperature selection dials marked with prominent numbers; dials are located on the face of the thermostat to avoid smudging of walls by the user in adjusting side controls. Dial type thermometer is designed to tell room temperature at a glance; selector switch permits a choice of four position settings. Separate spiral bimetals actuate individual heating and cooling mercury tube switches which are intended to eliminate dirty contacts. Heat and cold anticipation are featured, according to the company. Unit is mounted directly to the wall without auxiliary back plates; thermostat is said to extend less than 1⅞ in. from the wall on which it is mounted. Horizontal motif of the unit, satin-finish stainless steel exterior and gray plastic back plate are designed to blend with modern room decor, the company reports.


You're
**YEARS AHEAD**
with **MARLEY!**

Want the very latest? Then there's only one line of packaged water cooling towers for you — and that's the '55 Marley line! Every advancement in packaged water cooling is engineered by Marley and all are incorporated in the complete line of '55 AQUATOWERS* and AQUACOOLERS.*

1955 AQUATOWERS are compatible with surroundings wherever placed. There are no projecting parts; all mechanical equipment is encased and protected. Round corners improve appearance and add structural strength. The durability and performance ability that have made AQUATOWERS the standard are retained and enhanced in the '55 line.

For indoor installation where the cooling tower must operate against high external static pressure or for unusual location limitations outdoors, the Marley line includes the new AQUACOOLER. Duct-work can be attached simply and economically to this all-galvanized counter-flow tower. Its design insures its performance: all models have large centrifugal blower fans, balanced spray systems utilizing patented Marley bronze nozzles and redwood filling. Available in five sizes from 3 to 15 tons.

"Nothing cools as well as water . . .
nothing cools water as well as a Marley Tower"

*Trademark Reg.

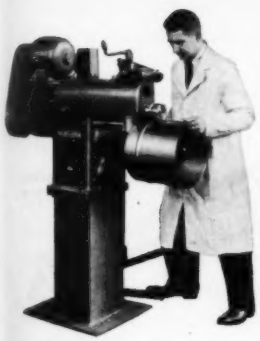
**The Marley Company**
Kansas City, Missouri

MARLEY

# New Deep Throat Combination Rotary Machine added to versatile, popular Niagara line

# 12 MACHINES IN ONE!

No. 150 Hand Operated
Deep Throat Combination Machine



No. 180 Power Operated
Deep Throat Combination Machine

No. 104 Multi-Drive Power Table
for Motorizing Hand Machines

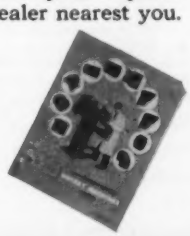
Variety of models, versatility, ruggedness, operating ease, low-cost service and modern design have *for years* made Niagara Rotary Machines *the preferred line.*

And now, the new and improved No. 150 Deep Throat Combination Hand Machine joins the famous Niagara Rotary family.

*Truly, it is 12 machines in one.* Readily equipped with 12 different pairs of standard rolls (carried in stock), it is without equal for efficient and profitable turning, burring, wiring, elbow edging (3 types), single beading, OG beading, crimping, furnace collar edging, body flanging, slitting and trimming operations. For utmost convenience, work can be fed in either direction with the same, clockwise cranking. *Here's a multi-purpose machine that will turn out real profits for you!*

In sheet metal shop or industrial maintenance, Niagara is the Rotary Machine Line that has the most to offer. Power and hand operated models of varied types and work capacities, plus a wide range of forming rolls, make Niagara the only name you need remember to meet *all* your requirements. Write for new Bulletin 75 and the name of the dealer nearest you.

**FULL LINE PRESENTED IN COLORFUL NEW BULLETIN 75**
Here are 24 pages chock-full of information, including a helpful Selection Chart for picking the right machines and rolls.



NIAGARA MACHINE & TOOL WORKS, BUFFALO 11, N. Y.
DISTRICT OFFICES
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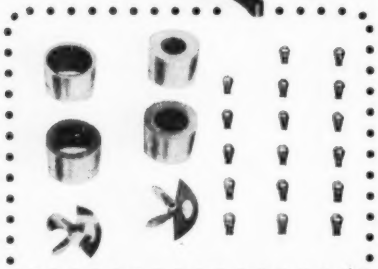
Dealers in principal U. S. cities and major foreign countries

**NIAGARA ROTARY MACHINES**
POWER AND HAND OPERATED

America's Most Complete Line of Presses, Shears, Machines and Tools for Plate and Sheet Metal Work

THIS IS A MONEY-MAKER FOR YOU!

SUGGESTED RETAIL PRICE
$109.50
(complete with 3 standard controls)



Mt Hawley

ALL-IN-ONE Oil Burner

Here's *one* burner you can stock instead of *three* – for it quickly adjusts to any capacity from .6 to 4.5 gph! Handles any job from a small home to a six-apartment building...gph can be quickly increased if the owner adds space.

Capacity changeover requires only two parts to be replaced: the choke ring and air diffuser. You get a complete set of these, as shown above, with each burner you order. Combine the correct two with any one of 17 commercial nozzles to get the gph rating you want!

Mt. Hawley ALL-IN-ONE (F45) comes in four burner tube lengths with universal flange or pedestal mounting. No complicated firing head or "hairline" adjustments – operation is simple, quiet, efficient. Weight: 52 lbs.

Your letter or postcard brings the whole story on this revolutionary new burner – at no cost or obligation. Don't put it off – write today!

MT. HAWLEY MFG. CO.
Dept. A-6 Route 88 and 174 Peoria, Illinois
Rush full facts on the revolutionary Mt. Hawley ALL-IN-ONE (Model F-45) oil burner! I do not obligate myself in any way.

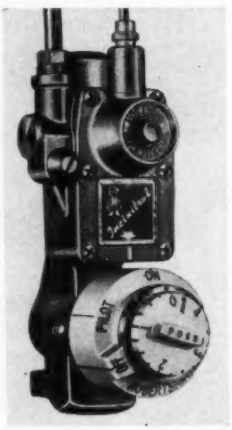
Name.....
Firm.....
Address.....
City..... State.....

M&M Mt Hawley MFG. CO.
PEORIA, ILL.


## equipment developments

### Incinerator Control

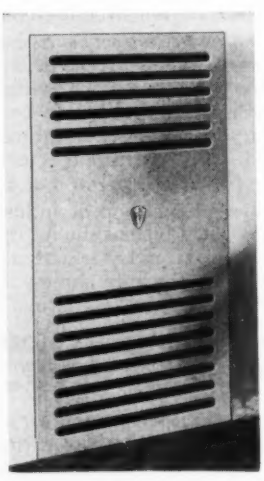
"INCINITROL" automatic control device for home incinerators — Robertshaw-Fulton Controls Co., Youngwood, Pa. Features are safety pilot,



gas cock and automatic timing. Safety pilot contains a 3 ft internal filter. Appliance starts and stops automatically once burning period has been selected. All automatic models have 4 hr timing mechanism.

### Forced Air Wall Furnace

"TROPIC WALL" No. 11 oil furnace designed for maximum warmth without loss of livable room — Silent



Sioux Corp., Orange City, Ia. Heating capacity is 58,000 Btu. Main features include zero clearance, front servicing, forced heat circulation, remov-

There's an Easier Way!

Break away from old fashioned cutting methods . . . save time, temper and patience. Now . . . zip through 3/16" aluminum, Fiberglas, plastics, plastic laminates, even 16-gauge steel, with minimum effort . . . maximum speed . . . with the KETT Panel Master Saw. Its performance is outstanding on metal laminates such as Mirawal, Metlwal, Met-L-Wood and Amorply. Two-inch diameter saw blades give full 3/8" depth cut. Leaves accurate, smooth milled edge that requires no sanding or finishing. Amazingly easy to use . . . extra rugged for long, hard service.

Powered by heavy duty, industrial type 110 volt AC/DC portable 5/16" capacity electric drill motor. Ball bearing equipped drive for smoother operation.

*Write for Catalog A-18*

Use handy Coupon below

KS-3AM Panel Master Saw

THE KETT TOOL COMPANY
5 E. Third St. Cincinnati 2, Ohio

THE KETT TOOL COMPANY
5 East Third St.
Cincinnati 2, Ohio

Gentlemen:

Please send me your Catalog A-18 giving complete details on the KETT Panel Master Saw.

NAME .....
COMPANY .....
ADDRESS .....
CITY ..... ZONE .... STATE .....

able burner, optional thermostatic control, built in cleanout rod and draft diverter. Front panel and grille are finished in light tan to blend with room decor.

### Transformer Type Welders

MODELS TLP-253-S (with capacitors) and TL-253-S (without capacitors) a-c transformer type arc welders — Hobart Bros. Co., Canal Lock Sq., Troy 1, O. Both models are dual rated at 250 amp on 30 percent duty

cycle or 200 amp on 50 percent cycle for operation on single phase, 60 cycle, 230 volt supply line. Welding current selection is made on hand wheel and rheostat knob. "Saturable leakage path" transformer has no moving parts. Safety features include absence of electrical connections between power lines and welding cables, and double insulation and physical separations between primary and secondary coils.

### Manual Shutoff Valve

SERIES 370C two port straight through shutoff valve for fuel oil lines — Anderson Brass Co., 5303 12th St., Detroit 8. Valve has solid bottom and spring loaded packed top; exterior 90 deg stops are said to provide accurate fuel oil control in open and closed positions. Series is available in ¼ and ⅛ in. male


VULCAN
AIR-TRIM
warm air baseboard

. . . the newest, most competitive warm air baseboard on the market

Designed for Economy and Performance

Top efficiency *plus* economy assured through easy-to-install baseboard that distributes warm air evenly over extended wall areas. Eliminates wall "streaking" and "scorching" of drapes and curtains.

Styled for Beauty

Yes—outstanding in style and beauty because its fashioned after Vulcan's famous TRIMLINE design, the choice of discriminating homeowners.

Designed and Styled to help you SELL MORE . . . PROFIT MORE

The distinctive design helps to make your selling job easier. Smarter looking, more attractive, AIR-TRIM pays you a bonus in increased sales. And its packaged for easy stocking 2, 4, 6, 8 and 10 ft. lengths.




Write now for your AIR-TRIM Bulletin. Data and installation instructions included.

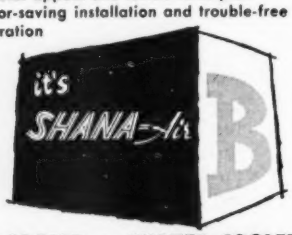
ORIGINATORS OF FIN-TUBE AND BASEBOARD RADIATION IN AMERICA

The VULCAN Radiator Company
775 Capitol Avenue • Hartford 6, Conn.

any way you look at it...

**COMPLETE HOME AIR CONDITIONING UNITS!**

- Greater profits at minimum investment
- Popular appeal and tested sales plan
- Labor-saving installation and trouble-free operation




**AIR-COOLED or WATER-COOLED**
individual or combination units for any home in any state

Priced below competition with a new financing plan! The industry's finest 1½, 2, 3 and 5 ton units!

**EXCLUSIVE TERRITORIES STILL OPEN**

*Write, wire or phone today*

**SHANA MANUFACTURING, INC.**
455 W. Randolph Street, Chicago 1, Illinois
Gentlemen:
I am interested in knowing more about SHANA-AIR HOME AIR CONDITIONING.
☐ DEALER ☐ DISTRIBUTOR ☐ MFG. REP.
Others please specify
Name_____
Firm_____
Address_____
City_____ Zone____ State____


## equipment developments

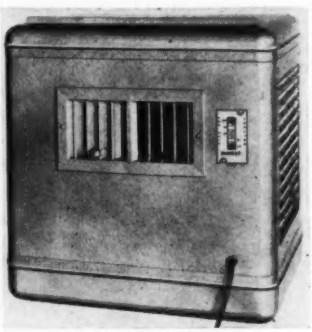
and/or female thread, ⅜, 5/16 and ¼ in. flare or ball sleeve.

### Oil Fired Duct Heaters

UHD SERIES oil fired duct heaters in five capacities for installation in air cooled ducts — Delta Heating Corp., 1 Cole St., Trenton 8, N.J. Designed for use with remote operated air cooling unit, units have flanged inlet and outlet sides for attachment to ducts. Largest model, UHD 220, has 220,000 Btuh output; smallest model, UHD 112, has 112,000 Btuh output. Heaters are designed to operate with drafts as low as 0.01 in., the company states.

### Portable Air Coolers

BLOWER model portable evaporative air cooler with push button control located in center of the grille —

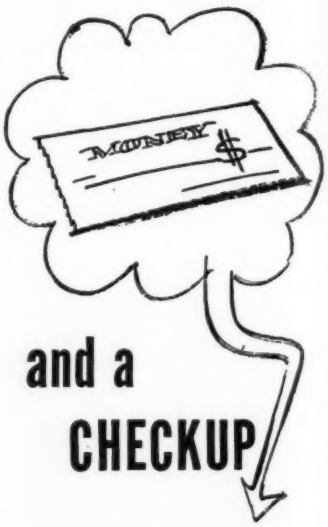


Pioneer Furnace Co., 3131 San Fernando Rd., Los Angeles 65. Unit has an output of 600 cfm, weighs 30 lb and occupies 18 × 17 × 13 in. Other models include a new blower type cooler for home installations and a down draft cooler for home and commercial use. The blower model also has front panel grille push button control.

### Aluminum Insulation

TYPE 6PS prefabricated joist to joist, multiple-layered aluminum, fiber and air space insulation comprising 3 in. depth — Infra Insulation, Inc., 525 Broadway, New York 12. Three aluminum sheets and two accordion fibers reaching from joist to joist


fight cancer with a CHECK




and a CHECKUP

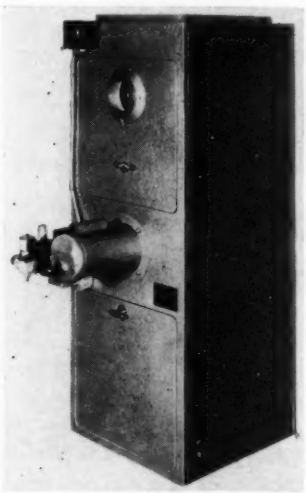
a check
to help others...
a checkup
to help yourself.

AMERICAN CANCER SOCIETY

are backed up by six reflective spaces; top sheet of aluminum is 1¾ in. from the center aluminum sheet on which rests a ¾ in. accordion fiber; another sheet of aluminum is 1¼ in. below.

### Gas Fired Furnace

MODEL GH 85-B gas fired highboy furnace with 84,000 Btuh input — Roberts-Gordon Appliance Co., 44 Central Ave., Buffalo 6, N.Y. Teardrop, airfoil combustion chamber design and multi-pass tube heat exchanger provide greater heating surface, according to the manufacturer. Fired by "Spreader-Flame" burner, unit is equipped with factory built filter rack and return air boot, glass fiber foil-faced insulation, front service panel, combination fan and limit switch, soft seat solenoid valve and round thermostat.



### Oil Fired Water Heater

DIRECT oil fired water heater designed for auxiliary installations so no added fuel tank is required — Radiant Utilities Corp. 8817 18th Ave., Brooklyn, N.Y. Heater operates as independent unit, burning fuel from the same tank which supplies oil to the heating unit. Heaters have combustion chamber, relief valve and insulated flush steel jacket; each has radiant burner.

**UNXLD QUADRANT**
Formerly Manufactured by
PARKER-KALON . . . Now
Made by DURO-DYNE

# BIG RESPONSIBILITY!

**Since Parker-Kalon introduced the UNXLD Damper Quadrant more than 30 years ago, it has been accepted as the standard by leading architects, engineers and sheet metal men throughout the world. Manufacture and sale of the Unxld Quadrant, as well as the "Jiffy" and Dial Regulators, plus more than 100 other P-K items, was a big responsibility recently undertaken by the Duro-Dyne Corporation. Duro-Dyne is upholding the famous P-K tradition of dependability and performance.**

**That tradition is exemplified by Duro-Dyne's *complete line of flexible duct connector products. Preassembled* types include DURO-METAL-FAB for heavier gauge ductwork, and ECON-O-FAB for residential and lighter gauge ductwork. DURO-METAL-FAB and ECON-O-FAB eliminate the nasty job of attaching fabric to metal. Both have the exclusive Double-Loc metal-to-fabric seam which prevents the fabric from pulling out or being cut by the metal when the finished connector vibrates.**

**When quality fabric without metal is desired, Duro-Dyne's high quality DUCT FABRIC fills the bill. Choice of 6″ and 10″ wide canvas, 6″ wide asbestos and neoprene. Packed 100 ft. roll per handy dispenser carton.**

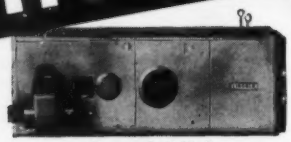
**Whatever your Flexible Connector needs, Duro-Dyne can fill them with DURO-METAL-FAB, ECON-O-FAB or DUCT FABRIC. Available where you buy your UNXLD QUADRANTS—at your local PK-Duro-Dyne Distributors.**

**DURO-DYNE *Corporation***

**800-B Third Ave., New Hyde Park, New York**

Switch to—

LINCOLN



Suspended Units

Lo-Boy Units

Hi-Boy Units

Gas-Fired and Oil-Fired Furnaces and Air Conditioners

**COMPLETE LINE** — size ranges from 75,000 to 180,000 B.T.U. output at bonnet.

**COMPLETE PACKAGE UNITS** — factory assembled and tested — ready to install.

**10 YEAR WARRANTY** — on both the combustion chamber and heat exchanger.

**MAXIMUM HEAT TRANSFER** — assured by high efficiency 12 gauge steel heat exchanger.

**FULLY U/L APPROVED** — and acceptable by both F.H.A. and V.A.

**SALES AND ENGINEERING ASSISTANCE** — to help you land the sale, to help you with your installation problems.

**COMPETITIVELY PRICED** — every unit priced to meet today's competitive market.

**Exclusive distributor and dealer franchises are available in certain desirable areas. Inquiries are invited.**

WRITE FOR FULL INFORMATION

LINCOLN FURNACE Co., Inc.

MANUFACTURERS OF GAS & OIL FURNACES AIR CONDITIONERS

230 Goffle Road • Hawthorne, N. J.


## equipment developments

### Portable Electrostatic Air Cleaner

"MICRONAIRE" portable electrostatic air cleaner designed for removal of smoke and impurities from the air — Raytheon Mfg. Co., Waltham 54, Mass. Unit is

also said to remove certain bacteria up to 99 percent efficiency. Operating on static electricity, unit catches particles as small as 1/250,000 in., the company states. Mounted on casters, unit can be plugged in any outlet. Air is drawn in at bottom; fan blows it over series of charged aluminum plates. Machine is 30 × 15 in., weighs 60 lb.

### Packaged Air Conditioner

PACKAGED WATER cooled summer air conditioner in 2 or 3 ton sizes, designed to fit in homes where space is at a premium — Permaglas Div., A. O. Smith Corp., Kankakee, Ill. Feature of the unit is adaptability to any type of central warm air furnace installation, according to the company. Cooler measures 26 × 42 × 22 in.

### Heavy Duty Ventilator

"GIANT TRIANGLE" 4 to 12 pitch ventilator with wide louvers designed to blend with modern broad siding — Leigh Building Products Div., Air Control Products, Inc., Coopersville, Mich. Front edges are rolled for massive appearance and rigidity; tabs lock them to the side margins; special back edge on each louver keeps out driving rain, according to the manufacturer. Ventilators are in 6, 8 and 10 ft widths; free areas range from 114 sq in. on 6 ft model and 247 sq in. on 8 ft unit to 417 sq in. on 10 ft ventilators.

# *new literature . . .*

### *1955 Edition of ASHAE Guide*

THE HEATING VENTILATING Air Conditioning Guide 1955 ($12.00) has been extensively revised and enlarged. The technical section is 1160 pages and the equipment section includes technical data concerning the products of 328 manufacturers — American Society of Heating and Air-Conditioning Engineers, 62 Worth St., New York 13. The many revisions and expansions are the result of research by the society and others, changes in codes and standards, new methods in product design, and improved engineering practices. The 53 chapters are grouped as 1) Fundamentals; 2) Human Reactions; 3) Heating and Cooling Loads; 4) Combustion and Consumption of Fuels; 5) Systems and Equipment; 6) Special Systems; and 7) Instruments and Codes. The changes include several rewritten chapters and a new chapter on schoolhouse heating and ventilating.

### *One Piece Return Air Grilles*

FOUR PAGE BROCHURE describes return air grilles featuring one piece assembly — Titus Mfg. Corp., Box 810, Waterloo, Iowa. The grilles are designed for any size opening, eliminating the need to fit sections together. Illustrations show complete assemblies as well as details of curved, hemmed fins said to give 80 percent free area.

### *Sheet Metal Working Equipment*

TEN PAGE CATALOG (No. 55) includes information on "Wyco" polishers and grinders, flexible shafts and flexible shaft machines, sanding discs, polishing drums, polishing wheels, drum sanders, and abrasive sleeves — Wyzenbeek & Staff, Inc., 223 N. California Ave., Chicago 12. The catalog is made up folded to be used as a mailing piece or punched if it is to be used as a catalog insert. It is available from distributors or from the firm's Chicago office.

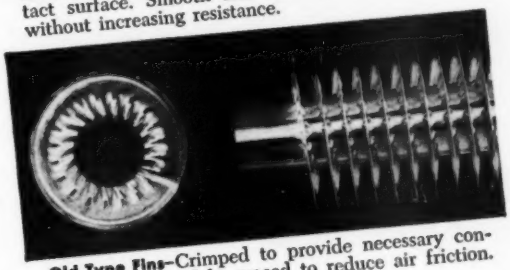
### *Exhaust Fans*

CATALOG OF EXHAUST FANS includes photographs, dimensional drawings, specifications and installation suggestions — Broan Mfg. Co., Inc., 1669 N. Water St., Milwaukee 2.

### *Residential Air Conditioning*

AIR CONDITIONING sales promotion package includes such merchandising aids as direct mail pieces, information on store, wall and "installed here" signs, catalog inserts, radio spots, and descriptions and photos of mats available for local newspaper advertising — the Air Conditioning Div., American Radiator &

**New Smooth Fins**—Wide base provides ample contact surface. Smooth fins can be closely spaced without increasing resistance.



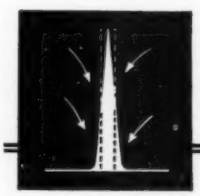
**Old Type Fins**—Crimped to provide necessary contact surface, widely spaced to reduce air friction.

**NEW *Smooth-Fin***
**Aerofin Coils**
**for Greater Capacity**
**Lower Resistance**

Aerofin extended-surface heating and cooling coils now offer you an even greater area of effective surface — even greater capacity — per square foot of face area. Airway resistance is lowered; higher air velocities can be used. The result is extremely high heating or cooling capacity in a given space.

Compact, sturdy, standardized encased units arranged for simple, quick, economical installation.

**Write for Bulletin S-55**



AEROFIN CORPORATION
101 Greenway Ave., Syracuse 3, N.Y.

The new Aerofin smooth fins are tapered, with wide base that conducts sufficient heat between fin and tube to make the entire fin effective transfer surface.

*Aerofin is sold only by manufacturers of fan system apparatus. List on request.*

## new literature *(Continued)*

Standard Sanitary Corp., Elyria, O. In addition to circulars and other envelope stuffers, the consumer pieces include 8½ × 5½ cards with space provided for dealer imprint.

### Ventilating System Motor Controls

A 68 PAGE CATALOG of general purpose control devices includes a special section correlating by horsepower components for each type of motor control application — General Purpose Control Dept., General Electric Co., Schenectady 5, N. Y. Designated GEC-1260A, the catalog contains photos, book prices, wiring diagrams, and dimensions on motor starters, contactors, relays, solenoids, switches, push buttons, and pilot devices. Also included is information comparing applications and merits of manual and magnetic control and across-the-line control.

### Small Capacity Duct Furnaces

SPECIFICATIONS and performance data on series "D" small capacity duct furnaces are included in bulletin B-55-D — Reznor Mfg. Co., Mercer, Pa. The furnaces are available in 50, 75, 100 and 125 thousand Btu models. They are compact heat exchangers designed for combination with air moving, cooling, filtering and humidifying components chosen to meet the requirements of each job. They are adaptable for use in homes, stores and offices and other commercial buildings. A special blower assembly, designed for use with the duct furnaces, but supplied separately, is also described in the bulletin.

### High Pressure Air Diffusers

BULLETIN K-33 (48 pages) describes high pressure air diffusers — Connor Engineering Corp., 500 - 5th Ave., New York 36. Single and dual duct designs, typical layouts, velocity and pressure factors, duct sizing and construction, and sound control are among the subjects covered.

### Summer Air Conditioning Units

INFORMATION on direct expansion air conditioning units is presented in a four page illustrated circular — Auburn Burner Co., Auburn, Ind. Specifications are given for models ranging in size from 2 to 5 hp.

### Press Brake Dies

STANDARD "Chicago" induction hardened press brake dies are covered in bulletin D-4-55 — Dreis & Krump Mfg. Co., 7400 S. Loomis Blvd., Chicago 36. The bulletin presents ordering information on a wide

CONDUCTOR ELBOWS AND SHOES

- ALL SIZES
- ALL ANGLES
- ALL GAUGES
- ALL METALS

"Tapered to Fit"
"Galvanized after Formed"

THE CINCINNATI ELBOW CO.

4730 Madison Rd. Cincinnati 27, Ohio

SEE YOUR JOBBER

range of standard dies for production bending of sheet metal and steel plate on press brakes of any make.

### Oil and Gas Furnaces

GAS AND OIL fired furnaces are covered in forms L-207 and L-208 respectively — Airtemp Div., Chrysler Corp., 1600 Webster St., Dayton 1. Printed in full color, the circulars are illustrated with keyed photographs that show the location of components of both closet and basement models. Also available is a pocket size folder giving a brief history of the division and listing the types of heating and air conditioning equipment it manufactures.

### Small Thermostats

ILLUSTRATED brochure presents engineering data on "Temp-Guard" midget type thermostats for applications requiring accurate heat control — Franklin Dales Co., 180-184 E. Mill St., Akron 8, Ohio. Specifications cover contacts, terminals, cases, pre-calibration and insulation. The controls can be custom designed to fit particular applications.

### Alloy for High Temperature Service

DETAILED PERFORMANCE DATA on "Superalloy A-286" is furnished in a technical data folder — Allegheny Ludlum Steel Corp., 2020 Oliver Bldg., Pittsburgh 22. The alloy is a corrosion- and heat-resistant austenitic alloy, which has high strength at temperatures up to 1300 F, but can also be used above these temperatures for lower stress applications. Corrosion resistance and oxidation resistance data are included, along with application information, physical and mechanical properties and heat treating information.

### Blowers

LOOSE-LEAF CATALOG covers blowers for heating and air conditioning applications — Morrison Products, Inc., 16816 Waterloo Rd., Cleveland 10. One sheet is devoted to each type of blower and includes graphs, tables and other buying information. Illustrations include photographs of complete units as well as components.

### Slip Roll Formers

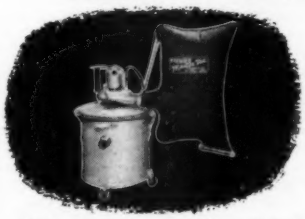
BOOKLET 77 describes roll forming machines — Niagara Machine & Tool Works, 683 Northland Ave. Buffalo 11, N.Y. Specifications given in the 18 page folder cover the complete line of power and hand operated slip roll formers and pinch type rollers. Slip roll formers are available in 6, 4, 3, 2, 1½ and 1 in.


now! new SPIC-SPAN

latest, low cost furnace, air conditioning and boiler cleaner

Here's *one* example of what Premier's new Spic-Span gives you: 3 times more filtering area in standard size filter! Money-saving result: Motor lasts much longer, air flow stays stronger, and filter doesn't have to be cleaned so often. At last, a machine that meets the demands of long-time furnace cleaning men at low, low cost! Remember: this is only *one* feature of Premier's new Spic-Span. It would pay you to know *all* the features. Compare Premier's specifications with any other's. (Our specs. are honest-to-gosh true.) For your own best advantage, write for all the details NOW!

"OLD RELIABLE"



**Premier 908F** — Still the most popular and the most praised of all. Has the working guts and rugged construction for heaviest of heavy-duty jobs. If there is *one* furnace and boiler cleaner you should know all about, this is it! Write Now!

*Both Premier machines listed by Underwriters' Laboratories and Canadian Standards Association.*

PREMIER

**the premier company**

735 Woodlawn Ave., St. Paul 1, Minnesota
35 Gerrard St. West, Toronto 2, Canada

The PREMIER Company
735 Woodlawn Ave., St. Paul 1, Minnesota

Please send me more information on your ☐ Spic-Span; ☐ Old Reliable.

NAME_____

FIRM_____

ADDRESS_____

CITY_____ STATE_____

## new literature *(Continued)*

sizes in lengths up to and including 120 in capacities. Built to handle heavy, medium and light weight sheet metal, the roll formers will take mild steel up to ¼ in. thick.

### Insulating Glass

POCKET SIZE folder lists standard size units of "Thermopane" insulating glass — Libbey-Owens-Ford Glass Co., 608 Madison Ave., Toledo 3. Ask for Form TP-31A.

### Insulation

FACTS about moisture condensation are presented in a 12 page booklet entitled *Enemy of Insulation* — Forest-Wool Insulation Co., Inc., 720 North State St., Big Rapids, Mich. The booklet explains what moisture condensation is and how "Pal-O-Pak" insulation is used to combat it. Advantages claimed include better coverage, permanent resilience and low "K" factor.

### Packaged Air Conditioners

FORM 8502 (eight pages) covers model B200A "Vornado" packaged air conditioning unit for small homes —O. A. Sutton Corp., 1812 W. Second St., Wichita 2. The unit is a 2 hp model, with air cooled condenser. It may be installed in attic, crawl space, garage or utility room in connection with existing heating systems or as a separate system.

### Indoor-Outdoor Weather Controls

ILLUSTRATED BULLETIN entitled *Extra Profits* (four pages) explains the savings provided by indoor-outdoor building heat controls — Automatic Devices Co., Inc., 714 Hillgrove Ave., Western Springs, Ill. Aimed at contractors and building owners, it describes in detail the operation of three different control units for buildings using various types of heating systems. Request bulletin 155.

### Clay Duct

ILLUSTRATED specification sheet presents information on "Ceramiduct" clay duct — Straitsville Brick Co., New Straitsville, O. The sheet contains detailed installation procedures in addition to dimensional data.

### Fuel Line Filters

TYPE "PL" pipe line filters designed for removal of water, oil, dirt and scale from fuel lines are described in an illustrated brochure — Air-Maze Corp., 25000 Miles Rd., Cleveland 28. Included is engineering, operating and application information. Also included is a table for quick computing of the correct size

OVER EVERY OBSTACLE and
AROUND EVERY CORNER with...
TRADE F. Dieckmann MARK
CONDUCTOR PIPE ELBOWS
One reason why roofers prefer Dieckmann elbows is the ease, speed and simplicity with which they can pass over and around every obstruction and carry water from roof gutters thru down spouts to outlet.
More than three quarters of a century ago Ferdinand Dieckmann designed and patented machines for making Dieckmann one-piece conductor elbows of all shapes, sizes, angles and metals.
Insist upon the Dieckmann trade mark.
THE FERDINAND DIECKMANN COMPANY
1180 HARRISON AVENUE
CINCINNATI 22, OHIO

filter for a given installation. One page is devoted to complete specifications for all standard models.

### Axial Mushroom Exhausters

DETAILED INFORMATION and performance tables on axial mushroom power room exhausters are contained in bulletin CAM - 102 — Chicago Blower Corp., 9869 Pacific Ave., Franklin Park, Ill. The exhausters feature a low silhouette designed to blend with contemporary buildings and can be completely concealed from the ground by parapet walls.

### Machinery Mounts

BULLETIN 546 (eight pages) describes the advantages of mounting machinery on mobile mounts — Barry Controls, Inc., 1000 Pleasant St., Watertown, Mass. Among such benefits, according to the company, are reduced installation and maintenance costs. Included is a summary of the types of "Barrymounts" which have been engineered for specific applications.

### Packaged Masonry Chimneys

EIGHT PAGE BULLETIN (RS 1) gives information on packaged masonry chimneys — Van-Packer Corp., 1049 State St., Bettendorf, Iowa. Product information, applications, specifications and installation procedures are given. The chimneys can be used with all home heating plants and incinerators in one and two story homes, can be ceiling or floor suspended or pier supported. They are supplied completely packaged, including flashing.

### Punches and Dies

CATALOG shows punches and dies standardized for use on various makes of hand and power punches, punch presses, power presses and special production machines — Whitney Metal Tool Co., 702 Forbes St., Rockford, Ill. The catalog is organized in sections by maximum hole sizes.

### Furnace Pipe and Fittings

ILLUSTRATED catalog (32 pages) contains specifications and prices on pipe and fittings — Buckeye Furnace Pipe Co., 897 Ingleside, Columbus 8, O. A pocket size catalog containing similar information is also available.

### Rivets

RIVET SELECTOR gives specific dimensions, clinch allowances and clearances for standard rivets — Milford Rivet Co., Milford, Conn. The selector is divided into four parts for bifurcated, cutlery, drilled and extruded rivets.


IT'S Beckett Pre-Fabricated DUCT AND FITTINGS for EVERY HEATING INSTALLATION EVERY AIR CONDITIONING PURPOSE

✔ Saves Hours
✔ Saves Labor
✔ Saves Money

Available in both Galvanized Steel and Aluminum

You take all the guesswork out of buying when you specify Beckett Pre-fabricated Duct and Fittings. Pre-fabricated Duct and Fittings by Beckett means precision fit for every assembly . . . less inventory headaches because you order for the job . . . lower installation labor costs by speedier assembly . . . versatile installations because there's a Beckett fitting for every type requirement.

For the most complete line of precision-made Duct and Fittings get all the facts . . . write for our new complete catalog.

COOLING EQUIPMENT

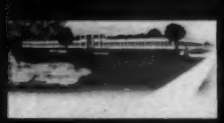
Beckett Recirculating Pumps, Float Valves, Fan Blades and Cooling Accessories have long proved their merit under every test. Another reason why Beckett products are acclaimed quality leaders in the Heating and Air Conditioning industry. Write for our new complete Cooling Equipment Catalog.

FAN BLADES

UPRIGHT PUMPS

FLOAT VALVES

SUBMERGIBLE PUMPS



Thomas Beckett & Co., Inc.
DALLAS, TEXAS
HOME OFFICE: 2521 Willowbrook Rd., Dallas, Texas
BRANCH OFFICE: 7543 Santa Monica Blvd., Hollywood, Calif.

# *we hear that . . .*

DEALERS from Minnesota, Wisconsin, Iowa and Indiana attended the marketing and engineering school held by Waterman-Waterbury Co. at Minneapolis

▸ WATERMAN-WATERBURY CO. recently concluded a series of three-day marketing and engineering clinics for its dealers. Sessions featured an analysis of the attraction, selling, technical skills and management values of each dealer's business. E. M. Delaney, sales and promotion manager for the company, was in charge.

▸ VAN-PACKER CORP. has introduced a new portable packaged exhibit to facilitate the display of packaged masonry chimneys at conventions, home shows, meetings and in salesrooms. The exhibit is 8 ft high when assembled and adjusts to fit any display space from 3 to 6 ft in width. It folds up into two compact packages designed to fit easily into the back seat of a car. Total weight is 60 lb.

▸ THE PEERLESS ELECTRIC CO. has begun construction of a $350,000 plant at Warren, O. to house its fan and blower division. The new building will provide sufficient operating facilities to permit the company to double its present fan and blower volume. The division plans to begin operations in the new plant about December 1.

▸ DREIS & KRUMP MFG. CO. has completed a new addition to its plant at 7400 S. Loomis Blvd., Chicago. The new building contains 40,000 sq ft and is equipped to handle the welding, frame machining and production line assembly of the company's smaller models of press brakes and presses of 11 to 150 ton capacities.

▸ GERWIN INDUSTRIES, INC. has produced a half hour sound-color film demonstrating a sales approach for "Thermo-Base" equipment. The film is available for showings at wholesaler-dealer meetings.

▸ SOME 725,000 SQ FT of aluminum sheet products will be used for exterior and interior siding, panels, roof decking and doors of the new sheet and foil mill


ANNOUNCING!

THE THREE MUSKETEERS PRESENT

RYBOLT "WHISPER QUIET" WINTER AIR CONDITIONERS . . .

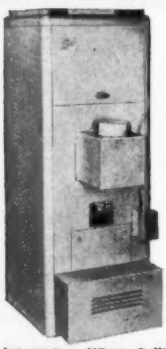
rh

CGA APPROVED

AGA APPROVED

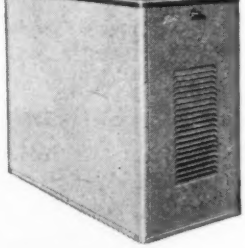
These proud new members of the 50 year old Rybolt family are: Factory assembled and wired. Have pressure tested wrap around radiators. Furnished with belt drive blowers and built in filter racks. Foil faced fiber glass insulation is used. Each unit has our "Whisper Quiet" exclusive design universal burner which is approved for all gases. A 10 year warranty backs up each unit and for additional sales help we offer cooperative advertising. Ask for full details.

Rybolt "Whisper Quiet", 80,000 B.T.U. Hi-Boy. This unit is designed for compactness and efficiency, measures 22 x 22 x 60". No finer unit can be built for the new home market. 3 additional models to be announced May 1st.



Rybolt "Whisper Quiet" 80,000 B.T.U. Lo-Boy. The answer to your service problems. Original designed heavy gauge casing provides access to burner, controls and blower without the use of tools. Full base pans on all units. Finished in an attractive, durable baked enamel. 5 additional models to be announced May 1st.

Rybolt "Whisper Quiet" 80,00 and 90,000 Counterflow. Amazingly compact, 22 x 22 x 60" and efficient, it's the answer to your perimeter heating needs. All equipped with self generating diaphragm valves for noiseless dependable service. 3 additional models to be announced April 15th.



Made right! Priced right! Write! Wire! Call! For price and sales franchise information.

THE RYBOLT HEATER COMPANY, ASHLAND, OHIO

84 SIZES OF SUMMER AND WINTER AIR CONDITIONERS TO CHOOSE FROM!

| Oil Fired | Gas Fired | Coal Fired | Cooling | |
|---|---|---|---|---|
| 4 sizes Hi-Boy | 5 sizes Hi-Boy | 4 sizes Gravity | 3 sizes Water Cooled Vertical | 8 sizes Water Cooled Gas Combination |
| 4 sizes Counterflow | 6 sizes Counterflow | 4 sizes Forced Air | 2 sizes Water Cooled Horizontal | 8 sizes Air Cooled Gas Combination |
| 6 sizes Lo-Boy | 8 sizes Lo-Boy | | 2 sizes Air Cooled Vertical | 6 sizes Water Cooled Oil Combination |
| 3 sizes Suspended | 2 sizes Lo-Boy | | 2 sizes Air Cooled Horizontal | 6 sizes Air Cooled Oil Combination |
| | 2 sizes Suspended | | | |

## we hear that *(Continued)*

of the Kaiser Aluminum & Chemical Corp. to be erected at Ravenswood, W. Va. Aluminum will be used extensively in the heating, air conditioning and ventilating systems, and the sheet metal requirements including flashings and closures, trim and gutters will also be met with aluminum.

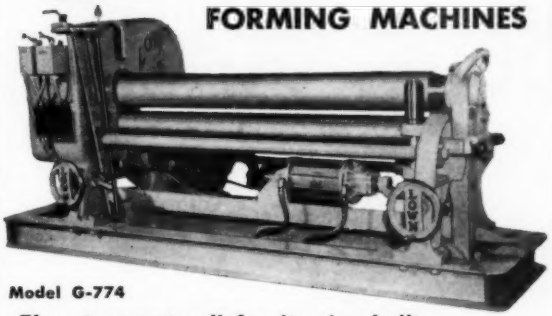
FEATURES of the octagon heat exchanger are pointed out by Clyde C. Whitcomb (left) to Chicago dealer Anthony Hodorowicz (right). Watching the demonstration are Frank W. Sieffert (second from left) and Charles J. Davis

▸ F. W. SIEFFERT AND SON, manufacturers' agents, are now representing Kalamazoo Furnace and Appliance Mfg. Co. in the Chicago area. The 25 year old firm recently held an open house for dealers to view the 29 models of gas and oil burning furnaces and to hear Clyde C. Whitcomb, president, Kalamazoo Furnace Co., narrate a slide film program that pointed out the highlights of furnace manufacturing principles at the Kalamazoo plant. Mr. Whitcomb also passed along some important points on selling techniques he has picked up in his 25 years in the sales field.

▸ THE RECENT air conditioning school held by Green Colonial Furnace Co. in Des Moines was attended by 250 dealers from seven states. Service and installation procedures were among the subjects discussed, as well as cooling load estimating. L. F. Oline, vice president in charge of sales, told the dealers that the skilled warm air heating dealer is the logical outlet for cooling equipment, and forecast a steadily expanding market for cooling equipment in rural as well as urban areas.

▸ A NEW COMPANY — Sterlairco Inc. — has been formed which is owned jointly by United States Air Conditioning Corp. and the Heat Specialties division of Sterling Radiator Co., Inc. The new company, with offices and factory in Westfield, Mass., has taken

LOWN Slip Roll
FORMING MACHINES



Model G-774

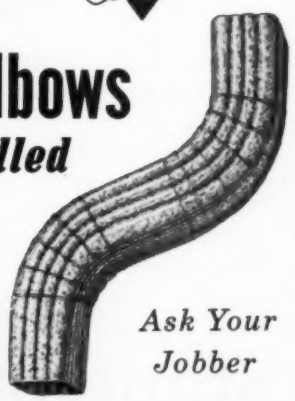
*The strongest roll for its size built*

- 7" diameter Top Roll, 6½" lower rolls.
- Capacity ¼" mild steel 6 ft. wide. (other sizes and capacities available.)
- Power Adjustment on Rear Roll, Air Cylinder on Drop Arm.
- Steel Base, Magnetic Brake Motor, Cone Rolling Attachment.
- Most compact transmission made anywhere—saves valuable floor space.
- Write for literature; always give ga. & width mild steel & dia. to be rolled.

**San Angelo Foundry & Machine Company**
1000 Upton San Angelo, Texas
Dealers in principal cities

NO PINCH!
It's a Cinch!

*WHEN*
Galvan Elbows
*are installed*
"THEY FIT LIKE A GLOVE"

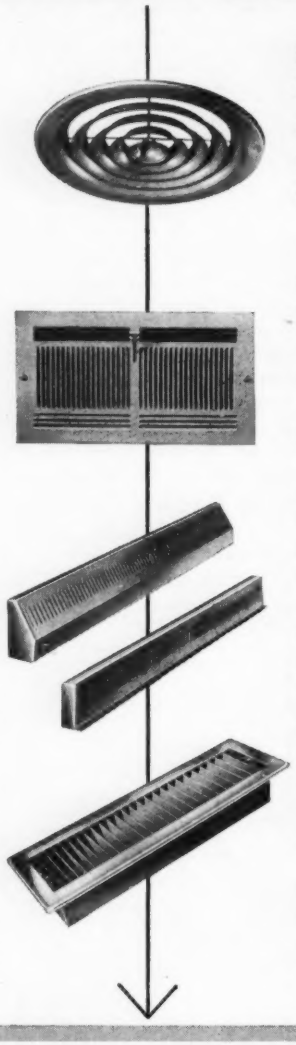


GALVAN
*Manufacturing Co.*
New Albany Indiana

*Ask Your Jobber*

ceiling... floor
...or anywhere between

# Better Diffusion



Standard Registers *shape* comfort, *aim* it, *diffuse* it evenly

Ceiling to floor, there's a Standard Register or Diffuser for a better job of shaping, aiming or spreading conditioned air. For ceiling outlets, two Standard Ceiling Diffusers—with flush or extended louvers—send warm or cool air to every corner evenly. (Also dampers and installation rings.) And for positive control of warmed air from the floor, there's the Standard Perimeter Floor Register with exclusive dialamatic control. Select the exact diffuser, register or grille for virtually any air-directing job from the full Standard line.

**MAKE REGISTER, DIFFUSER SPECIFYING EASIER**

Write for the Standard Register and Grille Catalog now!

Standard Stamping & Perforating Company
Dept. AA-6
3137 W. 49th Place, Chicago 32, Illinois
Please send me your catalog No. 54, on Registers and Grilles.

NAME_____
COMPANY_____
ADDRESS_____
CITY_____ ZONE____ STATE_____

Standard STAMPING & PERFORATING COMPANY
3137 W. 49TH PLACE, CHICAGO 32, ILLINOIS

## we hear that *(Continued)*

over the warehousing, sales and distribution of "usAIRco" and Sterling gas-fired unit heaters. G. H. Stenner, president of the Heat Specialties division, is president of the new company. C. E. Scott is vice president and general manager.

SALES ENGINEERS attending the air conditioning school conducted by Enterprise Heat & Power Co. discuss the features of a Shana air conditioning unit

▶ TWENTY-FIVE SALES ENGINEERS attended the first five-day school conducted by the Enterprise Heat & Power Co., Chicago. Other schools are scheduled to be held periodically throughout the season. At the schools, held under the supervision of Richard Lassar and Morton Simon, students learn about the construction, component parts, operation procedures and installation of air conditioning equipment manufactured by Shana Mfg., Inc., Carrier Corp. and United States Air Conditioning Corp.

▶ A SURVEY was recently conducted for Carrier Corp. by Fact Finders Associates, Inc. The survey covered homes across the country equipped with year 'round air conditioning, the majority having had it from one to five years. A great majority of the women interviewed reported that house cleaning was considerably easier since the installation of air conditioners. Draperies, furniture and carpets all stayed clean longer, they said, and indicated that they saved varying sums, averaging around $45 a year, in cleaning bills.

▶ THE JANITROL HEATING and Air Conditioning division of Surface Combustion Corp. recently concluded its annual series of eight factory service schools. Each school, of a week's duration, was divided into three sessions — gas heating, oil heating and summer air conditioning. Instructors are members of the division's engineering staff, who use the firm's laboratories as well as its production line for practical demonstration teaching.

## we hear that *(Continued)*

▸ Richard R. Wiss has been named president of J. Wiss & Sons Co., succeeding his father, J. Robert Wiss, who died March 9, 1955. Other officers are Jerome B. Wiss, vice president; Norman F. Wiss, Jr., first vice president; Burdette E. Bostwick, vice president; Frederick D. Wiss, treasurer; and Kenneth B. Wiss, secretary. Burdette E. Bostwick and Frederick D. Wiss were also elected to the board of directors.

▸ B. J. Hart and F. P. Munsinger have resigned as executive vice president and vice president respectively of the Southwest Mfg. Co. Glenn E. Morr has been elected executive vice president of the company and is in charge of its operations. Other officers are: president, C. Ginn, Jr.; vice president, F. E. Myers, II; and secretary-treasurer, M. G. Moses

▸ Wheeling Corrugating Co. plans to build a new warehouse in Minneapolis at an approximate cost of $450,000. The new building is scheduled for completion by the end of 1955.

▸ Feature of the annual sales conference recently held by Wm. Steinen Mfg. Co. was the introduction of a new line of draft control sizes. Jesse Tankel, general manager of the accessories division, outlined some of the goals for 1955 and Robert B. Reid, vice president of Mercready, Reid, Handy & Van Denburgh, talked on advertising and sales promotion.

▸ National Metal Fabricators has acquired a building adjacent to its present plant which will provide 10,000 additional sq ft of floor and yard area to the present facilities.

▸ Gibson Industries, Inc. recently submitted its "Mipatan" electric hammer to the approvals laboratory of the Canadian Standards Association for testing. The company reports that the hammer now carries the Canadian association's seal of approval.

▸ Henry F. Dever, president of Brown Instruments division, Minneapolis-Honeywell Regulator Co., has been elected president of the Scientific Apparatus Makers Association.

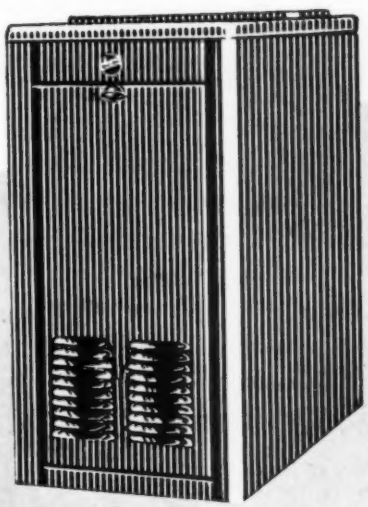
▸ The A. P. Green Fire Brick Co. presented "tailor-made" brochures to visitors to its booth at a recent oil heat show held in Toronto. Booth attendants determined which of the company's products were of most interest to the prospective customer and then


"The Good Business Line"

FULL PROFIT ...FIRST UNIT

Good Business does not depend on quotas, rebates, and involved discounts. It makes good sense to purchase heating equipment at the EXACT COST, receive full profit, and have that money to operate efficiently all year long.

Thermo-Products offer you this big advantage. They offer you the finest quality heating equipment, with FULL PROFIT from the very first unit you purchase. Also, they back the dealer with personal attention in advertising, sharing in the cost and supplying various dealer helps. For more information concerning the "Good Business Line" mail the attached coupon, today.



MANUFACTURERS OF A
COMPLETE LINE OF QUALITY HEATING EQUIPMENT
INCLUDING FLOOR FURNACES AND SUSPENDED DOWNFLOW UNITS

Thermo-Products, Inc.
NORTH JUDSON, INDIANA

Thermo-Products

Dept. 65B

THERMO-PRODUCTS, INC., NORTH JUDSON, IND.
Gentlemen: Rush me details, without obligation, on THERMO-PRODUCTS "GOOD BUSINESS LINE."

NAME_____ TITLE_____
FIRM_____
ADDRESS_____
CITY_____ ZONE___ STATE_____

## we hear that *(Continued)*

assembled pertinent literature and price lists and had them bound in plastic, an operation that took only a few seconds. According to John Corby, advertising manager for the Toronto branch, visitors appreciated the individual treatment as well as the book itself.

▸ More than 150 sales representatives and executives of 100 jobbing firms distributing products of the Williamson Heater Co. attended the company's recent annual jobbers sales meeting. Gus Leytze, vice president and manager of the jobber sales division, presented an evaluation of the sales potential for heating equipment for 1955. New sales techniques, training of air conditioning salesmen and servicemen and the company's service school were discussed by other executives.

▸ The Viking Air Conditioning division of the National Radiator Co. recently conducted a series of impact and vibration tests on a furnace equipped with the company's direct drive blower. In one test, the package was placed on a vibrating table for an hour and tossed about to duplicate the strains it would undergo in being hauled in a truck over 500 miles of rough roads. Another test consisted of sending the package down a steep incline to crash into wood pilings at the bottom of the ramp. At the completion of the tests, according to the company, the blower was run and found to be in perfect operating condition.

▸ The Lennox Furnace Co. has developed a model home promotion kit to assist builders in getting prospects to see and buy their homes. The package contains more than a dozen selling aids, including material explaining the advantages of using heating and cooling promotion in connection with model home demonstrations.

▸ General Electric Co. has started construction of a new facility in Tyler, Texas which will house the headquarters of its home heating and cooling department. The new plant is scheduled for completion by the fall of 1956.

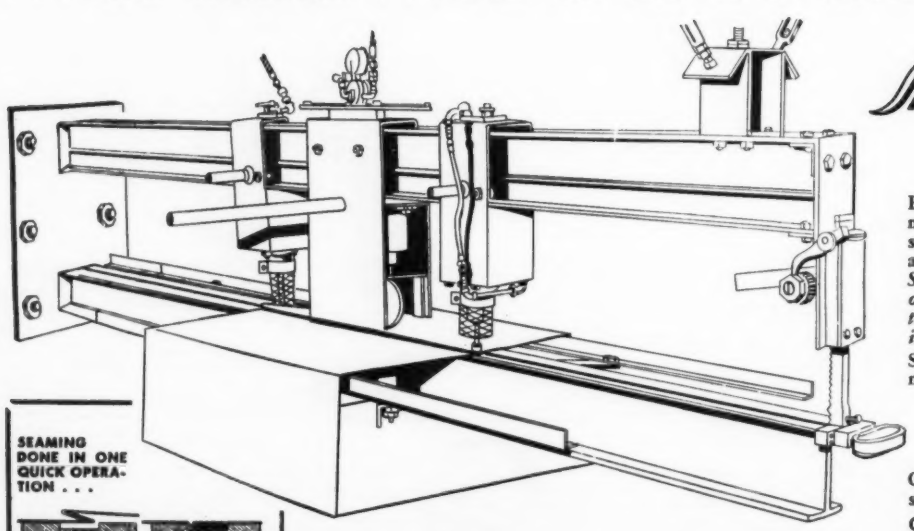
▸ The use of "PressuRated" plastic pipe and fittings, manufactured by The Yardley Plastics Co., has been authorized for air conditioning cold water applications in the cities of Columbus, Ohio and Baltimore, Md. In each instance, approval has been granted providing installation is accomplished in accordance with the manufacturer's specifications.


*Announcing* **MECHANICAL POWER**

**SEAMING *for* DUCTS!**

**. . . *are you interested in* MORE PRODUCTION SPEED? . . . PERFECTLY SMOOTH SEAMS?**

**. . . QUIET OPERATION? . . . *SURE* YOU ARE! BETTER INVESTIGATE . . .**




*Speed Seam* Q*

Here at last is a practical method of getting a perfectly smooth seam on ductwork in a matter of seconds! *The SPEED SEAMER will turn out over six times more work than your present hand seaming methods!*

SPEED SEAMER needs no more shop space than the "I" beam you now use, and it will easily and quickly handle ducts up to 10′ in length and 5′ in width.

Operates on compressed air system.

Get the facts today, for more profit tomorrow . . . Write

**SPEED-SEAM CO.** **820 North Wolcott Ave., Chicago 22, Ill.**

## we hear that *(Continued)*

Harold R. Swanson

Ruth Holton

▸ RUTH HOLTON was elected secretary of the Kalamazoo Furnace and Appliance Mfg. Co. at a recent stockholders' meeting. Miss Holton will continue in her capacity as office manager of the company. Harold R. Swanson was elected to the newly created post of assistant treasurer. Directors elected were C. C. Whitcomb, W. H. Young, Frank Arlen, J. T. Sloan, Jr., George K. Taylor, Charles E. Garrett, Sr., M. R. Bailey and Harold Usher.

▸ THE MITCHELL MFG. CO. has developed a trade-in plan for room air conditioners that will make reconditioned ¾ hp units available on the market for as little as $99. The plan authorizes dealers to offer up to $125 for old units taken in trade for 1955 ¾ or 1 hp models. Units taken in trade may be reconditioned by the dealer or sent to local authorized factory service depots for cleaning and reconditioning.

▸ PULLMAN VACUUM CLEANER CORP. has purchased Electric Blower Co. which will now become a division of Berns Mfg. Corp. Frank MacCallum, founder of Electric Blower Co., will join the Berns company in an advisory capacity.

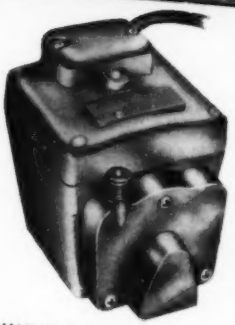
▸ THE SUNBEAM AIR CONDITIONING division of American Radiator & Standard Sanitary Corp. will now be known as the Air Conditioning division. T. W. McNeill, president of the division, said that the change in name will enable the air conditioning operation to capitalize more fully on the corporation's trade name. In the past, both "Sunbeam" and "American-Standard" have been used in the division's advertising, promotion and identification material. Concentration on the more widely known "American-Standard" will facilitate expansion in summer and winter air conditioning, Mr. McNeill stated. The move involves no change in policies or activities.

▸ A LOCAL ADVERTISING promotion package now being offered to dealers of Norman Products Co. features a complete set of mats designed for use in local newspaper advertising. Also included in the package are suggestions for setting up a local advertising pro-


GET....

LITTLE GIANT

PRODUCTS FOR TROUBLE-FREE SERVICE!



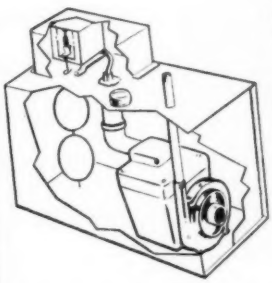
for EVAPORATIVE COOLERS

Little Giant hermetically sealed-in oil pumps need no lubrication. The three sizes available are just right for 95% of Evaporative Cooling Air Conditioning needs. Dependable in service, they are free from interruption. Little Giants will operate fully submerged.

AVAILABLE IN 3 SIZES
Can be furnished with threaded front.

OTHER APPLICATIONS:
- Milk cooler circulation.
- Cold drink dispenser circulators.
- Coolant circulation for machine tools.
- Yard fountains and minnow tanks.

LITTLE GIANT CONDENSATE REMOVER



Ideal for mechanical refrigeration installations; performs a necessary service wherever condensate must be drained. The pump is the dependable Little Giant fully submersible type perfectly controlled by the cycling of a positive action electric switch and float.

- Small and compact . . . quiet operating
- Coated to prevent corrosion
- Completely automatic
- Available in 3 sizes

Write today for catalog sheets, specifications and prices.

LITTLE GIANT VAPORIZER CO., INC.
5101 Classen Blvd.
Oklahoma City, Okla.

## we hear that *(Continued)*

gram including information on space ordering and planning a long range newspaper advertising campaign. Promotion packages are available from distributors or from the company's offices at 1150 Chesapeake Ave., Columbus, O.

▸ THE MOST INTENSIVE year of dealer training ever undertaken by the Coleman Co. is now under way at the Coleman Institute, Wichita. The first weekly school was held in March for dealers from Florida, Louisiana and Texas. The last school will be held in June for dealers from Pennsylvania. Altogether, dealers from all 48 states and the District of Columbia will attend sessions this year.

▸ INLAND STEEL CO.'S new Chicago headquarters will be housed in a 19 story building which will be covered with curtain wall panels weighing only 25 lb per sq ft.

▸ A WESTERN STYLE RANCH HOUSE furnished with heating and air conditioning equipment manufactured by the Rheem Mfg. Co. is the first prize in a contest being conducted by the Rheem company and the White King Soap Co. Contestants are required to send in an appropriate name for the house, along with reasons (in 20 words or less) for choosing that name, and enclose a boxtop or label from a White King product.

▸ HEATING WHOLESALERS CO. has purchased the Jones Automatic Service Co., a repair and rebuilding service for automatic heating controls and components for heating equipment. The new controls division will be headed by Gladstone Jones and G. A. Raffensperger, officers of the Jones company.

▸ FRANK J. GLEASON has been named executive vice president of Copeland Refrigeration Corp. Mr. Gleason, who joined the Copeland organization in 1937 as a vice president, will also continue in his present office of treasurer.

▸ THE COLUMBUS division of Breese Burners, Inc., has moved into new quarters at 1356 Norton Ave. Sales and field engineering offices as well as laboratories will be housed in the new building.

▸ THE ARMSTRONG FURNACE CO. recently completed a series of three week-long summer air conditioning schools covering sizing, installing and servicing of cooling equipment. Featured was a system of electrical panels which enabled an instructor standing at the control board to flip a switch and set up various types of air conditioning failures.

***benefit 3 ways!***

**INSTALL**

**PATCO AIR BASEBOARD**

**For Cooling**

**For Heating**

(1) You will lower YOUR installation costs, (2) get more jobs done and (3) make your customers more comfortable when you install PATCO AIR BASEBOARD. That's been the experience of contractors everywhere because:

1. you don't have to waste time handling and fitting bulky, rectangular duct work.
2. 4" or 5" round pipe (inexpensive industrial downspouting in 10' lengths) or standard duct work can be used with the PATCO connectors.
3. you simply nail the baseboard to the studs, snap on the diffuser face.
4. customers get pleasing appearance, greater economy, cleanliness, silent, draft-free operation.

PATCO AIR BASEBOARD
THE WALL RADIATES HEAT

Get complete details today and, remember, PATCO AIR BASEBOARD has all-around use in new or old homes, one story or two with or without basements.

PATCO MFG. CO.
231 N. 3rd St., Philadelphia 6, Pa.

# Manufacturers' Agents

*Are you interested in securing additional lines?*

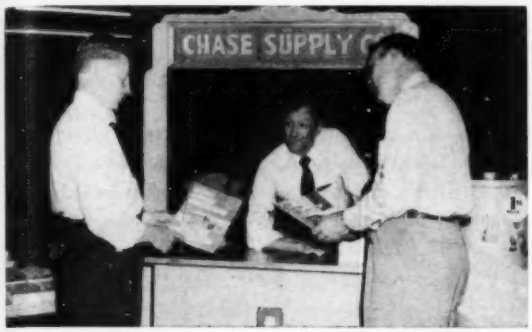
We are occasionally asked by our manufacturer advertisers to suggest the names of manufacturers' agents in various sections of the country whom they can contact in regard to representation of their residential heating air conditioning, and sheet metal products.

If you would like your name listed in our records for inquiries we may receive on your territory, we invite you to write us. There is no charge in connection with this service.

**AMERICAN ARTISAN**

6 N. Michigan Ave., Chicago 2, Ill.

## we hear that (Continued)




DISCUSSING the contents of the new catalog of the Chase Supply Co. are (*from left*) John P. Glass, Jr., Ben Prather and Lars E. Schulein

▸ THE CHASE SUPPLY CO., Chicago, recently sponsored an educational show for heating and air conditioning dealers. Feature of the show was a film furnished by the Air Conditioning and Refrigeration Wholesalers' Association entitled *How to Sell Quality*. Twenty-five manufacturers had booths at the exhibit, which was attended by more than 150 visitors.

▸ GEORGE E. HOCHSTEIN, sales manager of The Heil Co., has been elected president of the Oil-Heat Institute of America, Inc.

▸ THE UNION ASBESTOS & RUBBER CO. has started testing heating and air conditioning equipment at its new research and development laboratory in Chicago. One of the features of the new laboratory, writes the company's heating and cooling division, is a 10 × 13 ft room in which any climatic condition can be maintained.

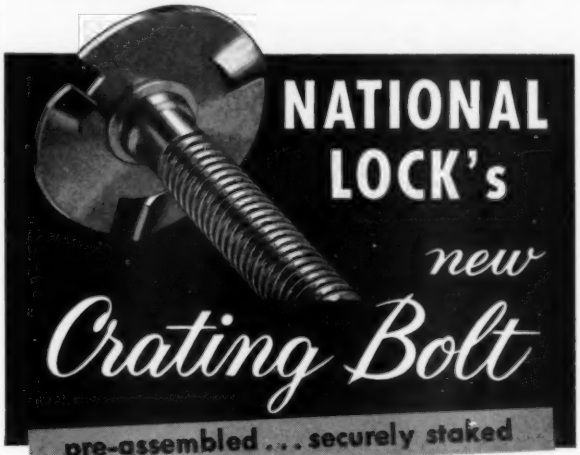
▸ H. S. WHELLER is the new president and general manager of L. J. Wing Mfg. Co. C. H. Smith is vice president and treasurer; H. S. Wheller, Jr., vice president and secretary; and T. R. Peyrek, vice president in charge of the heating and ventilating division.

▸ THE AIRTEMP DIVISION of Chrysler Corp. is now offering a 10 year unconditional warranty applicable to the heat exchanger of all furnaces manufactured by the division.

▸ THE FIRST annual Alexander Hamilton Free Enterprise award for service in public relations has been awarded to Robertshaw-Fulton Controls Co.'s Grayson Controls division. The award is for "the best year 'round public relations job in pointing up the advantages of America's free enterprise system."

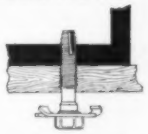
The company reports that its American Thermometer division has been re-designated the American


**dependable...low cost SHIPPING INSURANCE**




● You reduce shipping damage . . . minimize enamel chippage . . . when your appliances are firmly secured to crates with the new National Lock crating bolt. Bolt is sturdily staked to specially-formed hardened spring steel washer. Washer lugs bite into the wood, preventing bolt from turning. Also available as a nut and washer staked assembly . . . with lugs to prevent loosening. (Leading manufacturers have proven that loosening torque is greater than tightening torque.) Put National Lock crating bolts to the test in *your* shipping room NOW.

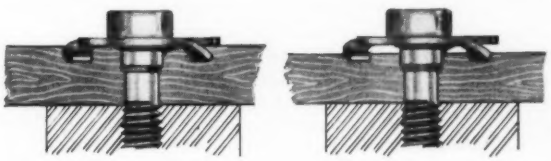
**METAL THREAD-CUTTING FEATURE SAVES CRATING TIME, CUTS COSTS**



Bolt is self-threading. Can be quickly and easily turned into metal foot or base of appliance. Nut is not required.

***lugs will not let go...***

**BEFORE SHRINKAGE** **AFTER SHRINKAGE**



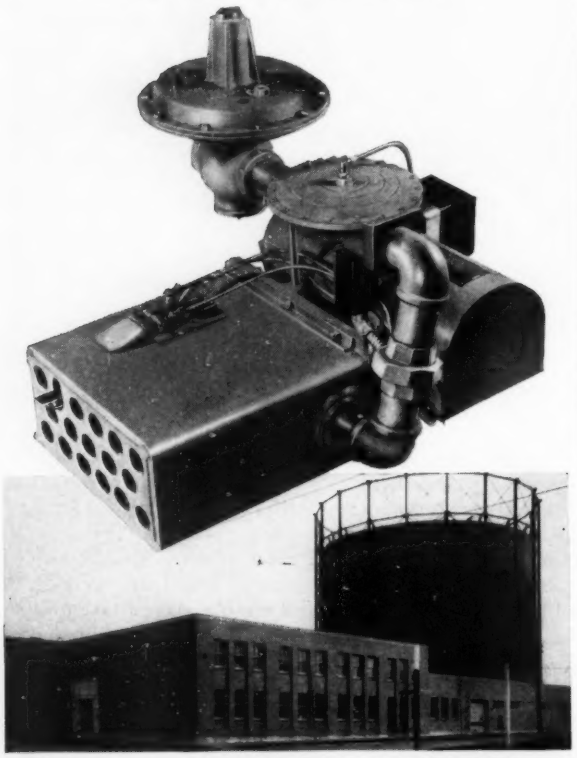
Our sales engineers will submit samples and work with you in solving your crating problems. Remember National Lock Company for all your special fastener requirements.

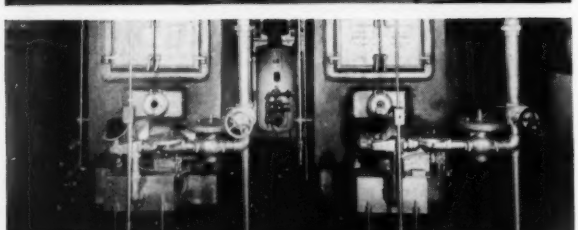
***Write for full information and prices***

**NATIONAL LOCK COMPANY**
Rockford • Illinois

# LO-BLAST

## THE POWER BURNER
## Gas Men Choose





*Two 2,800,000 BTU Lo-BLAST Burners in service shop building of Peoples Gas Light & Coke Co., Chicago, Illinois. In addition, a Lo-BLAST Economite is used for water heating.*

**Lo-BLAST costs 10% less to operate—less to install**

This burner uses an extremely quiet, low speed blower to provide perfectly controlled primary and secondary air—always independent of natural draft—more efficient and dependable.

A high chimney is not needed and complete factory assembly reduces installation costs. Inshot design reduces maintenance. Each unit is factory tested on gas.

**Capacities from 75,000 to 20,000,000 BTU input.**
**Write for engineering data.**

MID-CONTINENT
METAL PRODUCTS CO.
1960 N. Clybourn Ave., Chicago 14, Ill.


## we hear that *(Continued)*

Controls division. The change in name, which became effective May 1, will identify the division more closely with its products, the company said.

▸ THE WILLIAMS DIVISION of Eureka Williams Co. recently held two sales meetings, one in New York for the division's eastern staff and the other in Chicago for western representatives. Plans and objectives for the spring and summer selling seasons were discussed at the meetings, which were conducted by Charles Branch, division manager.

▸ WALL, FLOOR and forced air furnaces will soon be produced at the D. P. Ran Appliance Corp., a newly formed affiliate of Southern Heater Corp.

▸ MARKET POTENTIALS and sales opportunities for "Vornado" air conditioning units were discussed by Wes Brient of the O. A. Sutton Corp. at a recent distributors' meeting held by the company in Wichita. Mr. Brient estimated that there are more than 10 million existing homes in addition to thousands of new home projects forming a market potential for the units, which are specifically designed for use in low cost housing.

▸ R. T. MARSHALL, general manager of Airtex, Inc., Houston distributor for the Airtemp division of Chrysler Corp., recently visited the division's Dayton plant accompanied by 10 dealers who won the trip in a sales contest sponsored by the Airtex company.

▸ FORTY-FIVE SALESMEN of Robertson Heating & Supply Co. recently visited the Deming Co. for a day's schooling on pumps and water systems for cooling towers and evaporative condensers.

▸ THE HEIL CO. is offering its dealers a "heat bank" modeled after one of its automatic heating units. The bank, imprinted with the dealer's name and address, is one of various promotional items being offered by the company through wholesalers.

▸ SEYMOUR JARCHO, district sales manager for the Typhoon Air Conditioning Co., Inc., in Manhattan, the Bronx and Westchester County, was the winner of the company's 1954 distinguished salesman award contest.

▸ DONALD S. SMITH, president of Perfection Industries, Inc. was one of 10 outstanding business and civic leaders who recently received a 1955 Horatio Alger award. The awards were presented by Dr. Norman Vincent Peale.

# *appointments . . .*

▸ M. RAY BAUGH as general sales manager for the manufacturing and supply divisions of Champion Furnace Pipe Co. Mr. Baugh, formerly a partner in a wholesale heating operation, has had 20 years' experience in the heating and sheet metal business.

M. Ray Baugh

Thomas Sproule

▸ THOMAS SPROULE as manager of manufacturing of the General Electric Co.'s Home Heating and Cooling department. Mr. Sproule will be responsible for the department's manufacturing activities and will have plant operating responsibility at the Tyler, Texas facility which is now under construction. He will have his office at Bloomfield, N. J. until the new Tyler headquarters are completed. Mr Sproule joined the company in 1937 and has served in various positions, including manager of manufacturing for other departments. Prior to his recent appointment, he was manufacturing engineer in the company's manufacturing engineering department in Schenectady.

▸ ALBERT E. OTT as merchandising manager for Chelsea Fan & Blower Co., Inc. In this capacity, Mr. Ott will act as assistant to the executive vice president, supervising activities in the fields of advertising, sales promotion, service and marketing. He was formerly associated with the electric motor division of The Hoover Co.

Albert E. Ott

Richard F. Gang

▸ RICHARD F. GANG, for the past four years assistant sales manager for the Viking Air Conditioning division of the National-U.S. Radiator Corp., as general sales manager for the division, succeeding Frank

One Ring—
or thousands . . .
you'll Gain More with
NATIONAL Angle Rings
If you haven't worked with rings rolled by National, you're due for a pleasant surprise . . . for these true rings, guaranteed to fit your job, are:
1. Accurately rolled with uniform curvatures.
2. Easy to fit on the job.
3. Punched with the bolt or rivet holes you need.
4. Available in the metals you use — carbon steels, stainless steels, aluminum, etc.
5. The best value at the best price.
6. Ready for immediate delivery in leg out rings in many sizes.
National rolls to your specifications — angles, channels, tees, rods, flat-bars, pipe and tube —plain, or punched for riveting or bolting.
Tens of thousands of National rings have been used in all parts of the country by large and small sheet metal shops. They are rolled by experts on the most modern high-speed equipment to give you a precision ring at the lowest cost. Write today about your requirements, and the National list of stock sizes and quantity discounts.
Sheet metal fabricating and assembly work is another National specialty organized for YOU. Use it as your stand-by facility.
Phone —
Bishop 7-4255
NATIONAL METAL FABRICATORS
2142 S. Sawyer Avenue • Chicago 23, Illinois

In to stay when you use P-K
TRADE MARK REG. U.S. PAT. OFF.

Hardened
Screwnails

for fastening
SHEET METAL to WOOD
WOOD to WOOD
or other fastenings
where you need
NAIL DRIVING SPEED with
SCREW HOLDING POWER

Ask your P-K Distributor for samples and the SCREWNAIL folder, or write: Parker-Kalon Division, General American Transportation Corporation, 200 Varick St., New York 14.

PARKER-KALON®
FASTENERS

## appointments *(Continued)*

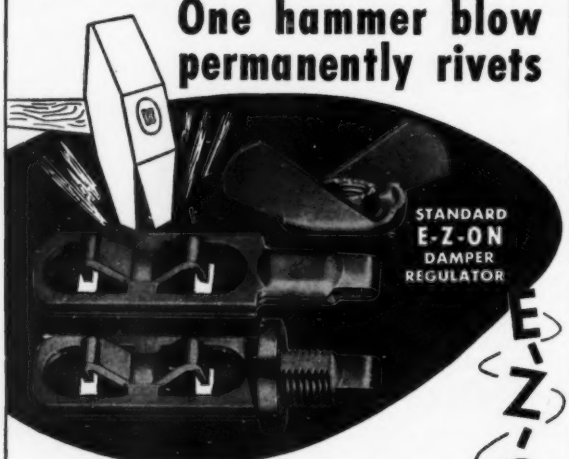
P. Gibbons. Mr. Gang joined the division in 1949 as sales promotion manager and has been assistant sales manager since 1951.

▸ W. J. PRIVER as sales manager for The Adams Mfg. Co. Mr. Priver has been a member of the company's sales staff for the past two and a half years.

▸ SIG STRAUS as national sales manager of Larkin Welder & Machine Co.

▸ JOHN H. MORAVA as manager of sales for the Chicago district office of United States Steel Corp. Mr. Morava was previously manager of sales for the Chicago industrial division. Edward W. Backes has been appointed manager of sales for the St. Louis office. Dwight L. Merrell and J. Gardner Brooks have been appointed assistant managers of sales in the Chicago district sales office. The following have also been named managers of sales: Wesley C. Bobbitt, Philadelphia office; Howard J. Mullin, New York office; Samuel W. Off, Washington, D. C.; John J. Lennon, Jr., Buffalo; and Donald K. Wright, Indian-

Cut Installation Costs!
One hammer blow permanently rivets




E-Z-ON

E-Z-ON Damper Controls are easily, quickly installed to save you time and money. E-Z-ONS lower initial cost offers you additional savings and extra profits. Start saving money now. . . . Call your jobber today!

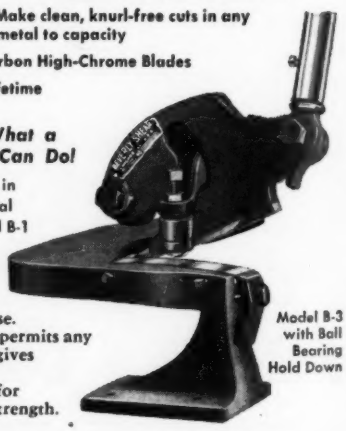
LEADING JOBBERS STOCK "EZ-ONS"
In Canada — THERMIDAIRE CORP. LTD. Toronto

M. A. GERETT CORP.
724 WEST WINNEBAGO STREET, MILWAUKEE 5, WISCONSIN

Cut ANY Shape in Metal...
with a BEVERLY THROATLESS SHEAR!

- Capacities to 3/16" in mild steel
- Make clean, knurl-free cuts in any metal to capacity
- High Carbon High-Chrome Blades
- Built to last a lifetime

Here's What a Beverly Can Do!
Cuts made in 18 ga. metal with Model B-1



Model B-3 with Ball Bearing Hold Down

Beverly Shears are the most versatile metal shearing tools you can use. Unique shoulder design permits any cut . . . rack and pinion gives great power with little effort. Alloy steel body for maximum rigidity and strength. Made in 4 models.

Write for illustrated circular —or see your Beverly Distributor.

Beverly SHEAR MFG. CO.
3020 W. 111th Street Chicago 43, Ill.

## appointments *(Continued)*

apolis. Boyd P. Doty, Jr., was appointed assistant manager of sales for the Philadelphia office.

▸ WILLIAM G. SMITH as national service manager for the Union Asbestos & Rubber Co.'s air conditioning products. Mr. Smith was previously district sales manager for the east-central division of Servel, Inc. He will make his headquarters at the company's Greenville, Ill. plant.

William G. Smith

William G. Findlay

▸ WILLIAM G. FINDLAY as manager of the Detroit steel service plant of Joseph T. Ryerson & Son, Inc. He succeeds Emroy M. Vehmeyer who has retired

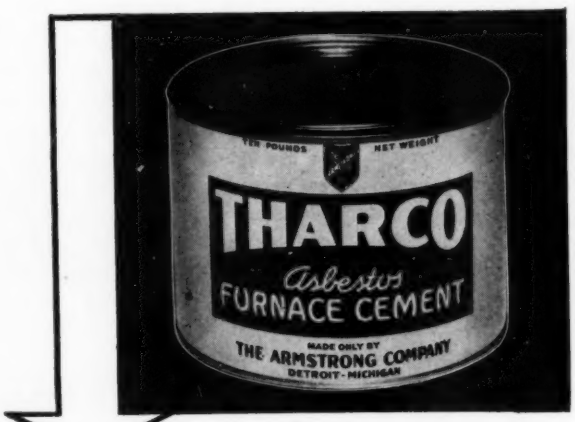

Make Stronger Fastenings this easy way

P-K
TRADE MARK. REG. U.S. PAT. OFF.

Hardened
**Masonry Nails**

**DRIVE EASILY** into mortar, cinder blocks, and other soft masonry without pilot holes . . . into pre-drilled holes in harder materials. **HARDNESS and TOUGHNESS** perfectly balanced . . . they drive in straight to stay tight, even under shock or vibration.
**COST YOU LESS** and are much simpler to use than plugs, expansion bolts, other devices. Samples free . . . try them. Ask your P-K Distributor, or write: Parker-Kalon Division, General American Transportation Corporation, 200 Varick St., New York 14.

**PARKER-KALON®**
**FASTENERS**




**STANDARD IN THE FIELD**

***Superior features of Tharco—***

- **No Shrinking**
- **No Cracking**
- **No Checking**

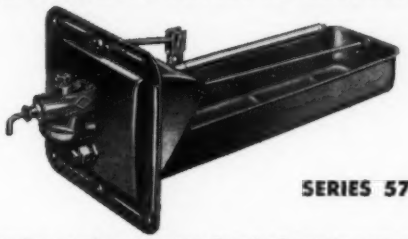
THARCO is available in either black or light gray in 1-pound cans to 350 pound drums.

*ORDER FROM YOUR JOBBER*

**THE ARMSTRONG COMPANY**
**241 S. Post Street • Detroit 17, Michigan**

EST. 1911

COMPLETELY ASSEMBLED
**Vaporite**
**AUTOMATIC HUMIDIFIER**
OFFERS QUICKEST—FASTEST INSTALLATION
ADJUSTABLE TO SLOPING OR STRAIGHT BONNET FURNACES



SERIES 577

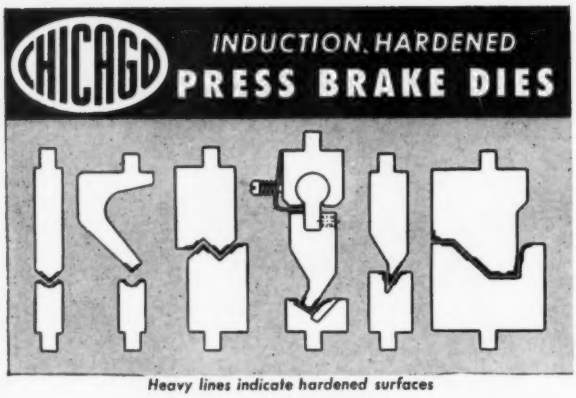
Stainless steel construction. Drip-feed puts just enough water in pan for fastest vaporization. Eliminates scum . . . no stagnant water pan.

Pre-assembly cuts labor time and costs. To install simply cut hole in plenum wall, slip VAPORITE in just as it comes from shipping package.

Get complete information. Write. A-6.

**Automatic Humidifier Co.**
**CEDAR FALLS, IOWA**

CHICAGO INDUCTION-HARDENED PRESS BRAKE DIES



Heavy lines indicate hardened surfaces

**for greater die life—**
**at no extra cost—**
**on any make press brake**

Whether it is a simple die for angle bending or the more complex dies for any of the combined bending and forming operations, CHICAGO induction-hardened dies offer bonus performance at no extra cost. Field reports on these dies show better than ten times the useful life of the conventional dies used in press brakes. Get the full particulars on CHICAGO induction-hardened dies for your next press brake job.

Steel Bending Brakes For Over Fifty Years 4901

DREIS & KRUMP MANUFACTURING COMPANY
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PREMIER'S FAN-AIR

diffusers can be the reason! Efficient, practical, easily installed, sensibly priced. Give your customers warm walls, warm windows, warm floors — in every room. Satisfied FAN-AIR customers will prove your best salesmen!

FREE *32-page Engineering Guide and all the "dope" you need to sell FAN-AIR Diffusers. Ask about complete FAN-AIR System; about CF and PZ Oil and Gas Units.*

PREMIER FURNACE COMPANY
Manufacturers of Warm Air Heating and Air Conditioning Equipment
Dowagiac, Michigan

## appointments *(Continued)*

after 46 years with the company. Mr. Findlay joined the Ryerson company in 1922 and has served in various capacities. Until his recent promotion he was assistant manager of the Detroit plant.

Clifford E. Hall

Robert H. Lowe

L. T. Ash

▸ CLIFFORD E. HALL as head of the newly formed utility operations department of the Coleman Co.'s sales division. The new department will be responsible for the direction and coordination of all sales, educational and promotional activities as they apply to gas utilities. Before joining the company, Mr. Hall was director of promotion for the American Gas Association. Associated with him in the operation of the department are Robert H. Lowe and L. T. Ash.

▸ WILLIAM F. OTTO as manager of New York district sales for Revere Copper and Brass Inc. Mr. Otto has been with the company since 1936. Harold F. Relyea has been appointed assistant manager of New York district sales and D. J. Spillane has been named assistant sales manager of merchandise. Mr. Relyea will continue as supervisor of general products distributor sales and special account executive and Mr. Spillane will have the responsibility for the sale of all building products to heating and sheet metal distributors.

▸ JAMES H. MONTGOMERY as Midwest regional sales manager for United States Air Conditioning Corp. Mr. Montgomery, formerly sales engineer for Servel, Inc., will be in charge of packaged air conditioning sales for six states, with headquarters in Chicago. Shaw-Gunter Refrigeration & Air Conditioning Co., Tifton, Ga., has been named a distributor of "usAIRco" air conditioning equipment in Tift county and southern Georgia.

▸ JOHN B. MEYER as product specialist for air conditioning for the eastern region of Rheem Mfg. Co. Mr. Meyer was formerly with the Military Air Transport Command as air conditioning and refrigeration engineer. He will have headquarters in the company's plant in Sparrows Point, Md.

## This X-Ray View shows why *quickdraft* alone can claim . . .

Patents are pending on the exclusive features of *quickdraft* which produce all the draft you need without obstructing smokepipe or flue. And we mean no obstruction—ever!

It's hard to believe, but true—the shorter the chimney, the better the draft with *quickdraft*. So, get all the facts. You'll want to use *quickdraft* on your next job. Write for complete literature, installation manual and name of nearest jobber, to Quickdraft Company, Dept. S, 1150 So. Erie Blvd., Hamilton, Ohio.

**quickdraft**
DRAFT CREATOR

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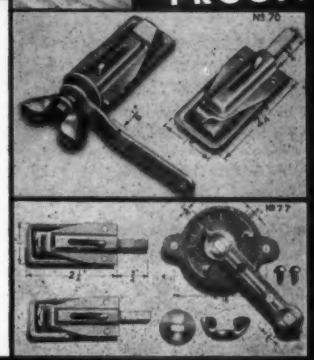
No anvil required. Both bearings have retractable bolts for easier installation. Their convenience and time saving characteristics makes them by far the most economical sets when installed costs are considered. See your jobber or write for literature.



**HART & COOLEY MANUFACTURING CO.**
500 EIGHTH STREET HOLLAND, MICH.
IN CANADA: HART & COOLEY MFG. CO. FORT ERIE, N., ONTARIO

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New! PIPE "Positive Lock" HANGERS
for ROUND PIPES
Eliminate old fashioned methods of hanging pipe on heating and cooling installations . . . cut costs and do a neater job. Hangers available in Six Lengths, from 2¾" to 11".
PATENT PENDING
NEW POSITIVE LOCK
IMPROVED SQUARE DUCT HANGER
NEW
With New "Positive Lock" cam action feature . . . No Special Tools! Hammer does the Job! Available in six lengths.
Cam Action Assures "Positive Lock"
AS LOW AS 2½¢ EACH!
PIPE
PIPE
PIPE
• Sharp prong pierces
• Insert "Positive Lock"—tap in place
• Drive sharp prong into joist
DUCT
DUCT
DUCT
SQUARE DUCT HANGER
No. 15
SEE your SUPPLIER or WRITE for FREE samples
TEST THEM YOURSELF ON THE JOB!
A. M. HEXDALL CO.
MORRIS, ILLINOIS
Manufacturers of Sheet Metal Specialties

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3 SPECIFIC SOLUTIONS TO 3 SPECIFIC HEATING PROBLEMS
Only DELTA Makes All 3!
DELTA DIRECT-FIRED OIL UNIT HEATER
For lowest cost industrial heating. Ideal for factories, warehouses, commercial buildings, and locations requiring high velocity air delivery.
DELTA SUSPENDED-HORIZONTAL FURNACE
Especially shallow for narrow crawl spaces and attics. Larger models for offices, partitioned spaces, stores, gas stations.
DELTA GUN-TYPE FLOOR LEVEL FURNACE
Provides an extremely effective, yet extremely economical central heating system for small cellarless homes.
WRITE FOR THE FACTS!
YOU can beat all your competition with this profit-packed trio of fine heating equipment . . . made exclusively and only by DELTA!
DELTA HEATING CORPORATION, TRENTON 8, NEW JERSEY
Representatives in all major cities

FLANGES THE DUCT
with Amazing Speed!
Less than 5 seconds on short and lighter pieces . . .
Slightly longer on bulkier pieces

MAKES PERFECT DRIVE-CLEATS TOO!

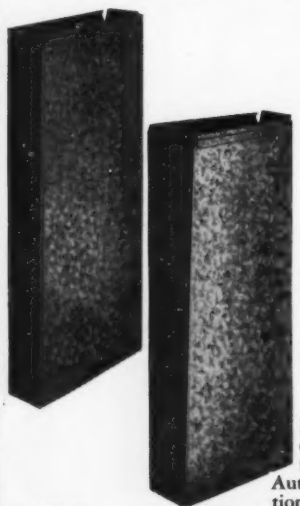
The ONLY tool that does both. A complete drive cleating tool . . . no set-up time . . . no adjustments. Handy to take out to the job when not needed in the shop. Turns idle time into production time. Flanges any square duct up to 20 gauge. Quickly pays for itself in time, material and labor savings.

No. 12 Smith's Cleat Bender (12" wide) . . $46.20*
No. 18 Smith's Cleat Bender (18" wide) . . $72.60*
*F.O.B. Waukegan, Illinois Prices subject to change without notice

PERFECT DRIVE CLEATS fit the duct without the use of a screwdriver.
TREMENDOUS SAVINGS in erection time and labor.

R. E. SMITH
1124 Elizabeth Avenue • Waukegan, Illinois

ALL YOUR NEEDS In DUCTS and FITTINGS



AJAX

- Highest Quality
- Precision Made
- Quick Assembly
- Forced Air or Gravity
- All Systems

Fittings, Pipe and Duct are die cut and formed, fit up tight and fast with AJAX Automatic Snap Lock connections.

For extra profits, use AJAX Pipe and Fittings to save you installation time and labor.

WRITE TODAY
New complete line catalog complete with helpful data.
DIVISION of
THE CINCINNATI SHEET METAL & ROOFING COMPANY

AJAX FURNACE FITTING CO.
216-20 E. Front St.
Cincinnati 2, Ohio

## appointments *(Continued)*

▸ FRANK TANLER as national sales representative for the White-Rodgers Electric Co. In his new position, Mr. Tanler will cooperate with regional sales managers giving special attention to production and service problems of manufacturers of heating and air conditioning equipment concerning the application of controls to their products.

Frank Tanler

Duane B. Becker

▸ DUANE B. BECKER as district sales manager for the air filter division of Research Products Corp. Mr. Becker will be responsible for sales in Wisconsin, Minnesota and the Dakotas. He has been associated with the company since 1947.

▸ HENRY J. COUCH as manager of the Chicago district office of Connor Engineering Corp. Prior to joining the company, Mr. Couch was with the American Air Filter Co. for 18 years.

▸ DAVID B. RUTHSTROM as district sales manager covering Houston and the surrounding area for The O. A. Sutton Corp. Joe Manuel has been named eastern district sales manager. Both men will work with distributors, builders and dealers on the sales and installation of "Vornado" residential air conditioners.

▸ FRANK J. SCIRE as chief engineer of the air conditioning division of The Mitchell Mfg. Co. Mr. Scire will supervise engineering for room air conditioners and central systems.

▸ EARL H. NEILSEN and Edmond Fain as direct factory sales representatives for General Fittings Co. Mr. Neilsen will cover the Rhode Island, eastern Connecticut and southeastern Massachusetts area. Mr. Fain's territory includes Maryland, Washington, D. C., Virginia and North Carolina.

▸ JOHN W. KELLAR as a member of the sales staff of Sall Mountain Co. Mr. Kellar will work on special assignments.

# The MODERN Lighter Tube
*With the Slanting Blue Flame*

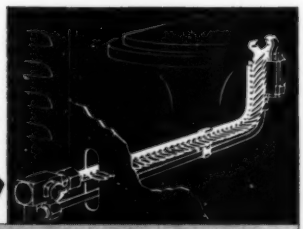
## Today's Great Contribution to Gas Appliance Safety and Dependability!

To safeguard all users of gas-fired heating equipment and appliances against hazardous lighting methods, more and more manufacturers are engineering the MODERN Lighter Tube into their units. Utilities and wholesalers too, strongly favor the MODERN Lighter Tube as a component part of all gas-fired units. Dealers recognize it as a vital sales feature. Available in aluminum or stainless steel ⅜ O.D. tubing.

The MODERN Lighter Tube offers the utmost in . . . .

★ SAFETY
★ DEPENDABILITY
★ SIMPLICITY
★ CONVENIENCE

PERFECTED OUTSIDE LIGHTING



**MODERN MATERIALS CO.**
NORTHVILLE MICHIGAN

# W. A. WHITNEY LEVER PUNCHES
*For Every Shop and Tool Box*

*Also supplied with three punches and three dies in a cardboard carton*

**No. 4B Punch**
**All parts drop-forged.**
**Most sturdy punch built for size.**
**Capacity — ¼" hole through 16 gauge metal**
**Length — 8½" Depth of throat — 2"**
**Weight — 3 lbs. Stock size punches 1/16" to 9/32" by 64ths.**
***Write for catalog — then contact your jobber.***

**W. A. WHITNEY MFG. CO.**
**636 RACE ST. ROCKFORD, ILL.**

# THE RIGHT SHEAR FOR ANY CUTTING JOB

## MARSHALLTOWN

**ROTARY THROATLESS SHEARS**

**CUTS ALL SHAPES—SIZES**
- **QUICKER**
- **EASIER**
- **FASTER**

**Here's a shear that's right for every job. Speedy — efficient. Cuts up to ¼ inch stock — speed to 6 ft. per minute. Excellent for irregular cutting or straight splitting. Available in hand operated or motorized models. Prompt shipment. Send today for special illustrated bulletin.**

**MARSHALLTOWN MANUFACTURING COMPANY**
**Marshalltown, Iowa**

**Nationally ADVERTISED AND RECOGNIZED**

**for over 25 years**

1930
1935
1940
1945
1950
1955

# Majestic INCINERATOR
**THE COMPLETE home disposal system**

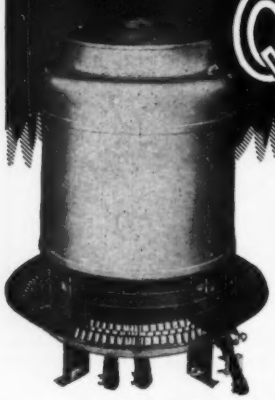
*Always a leader* in incineration, Majestic offers you today's most advanced incinerator—built with the skill and knowledge of more than a quarter-century of experience, and backed by a name renowned in the field. Millions of potential prospects this year will see the story of Majestic's *magic disposal* of trash and garbage. Be ready to profit from this national promotion!

*See your distributor or write*

**The *Majestic* Co., Inc.**
110-A Erie Street, Huntington, Ind.

The only ALL NEW
Water Saver on today's Market

QT COOLING TOWER



3 and 5 Ton Sizes
Light in weight
Quiet in operation
Efficient design
Rugged construction

For use with all makes of Water Cooled air conditioners.

Outdoor installation—safe for children or pets.

Low height and vertical air discharge.

Pleasing green FIBERGLASS CABINET AND SUMP PAN. (No paint ever needed).

Clear heart Redwood deck.

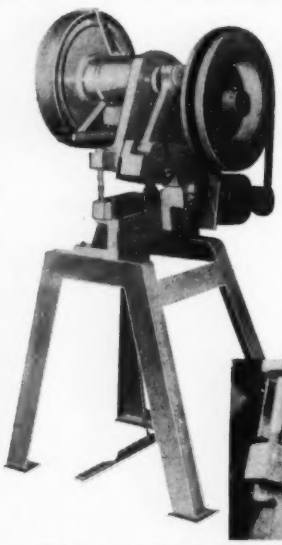
WATER TURBINE driven fan—No electrical connection to the QT.

ORDER NOW — IN STOCK

KENNARD CORPORATION
1831 S. HANLEY RD. • ST. LOUIS 17, MO.

Bateman Angle & Flat Iron Shear

IDEAL FOR THE USERS OF SMALL ANGLES OR FLATS



- No grinding necessary after cut.
- Cut angles up to 2" x 2" x ¼" and flats up to ¼" x 4".
- Flywheel with gear drive for power with a small motor.
- A one stroke cycle clutch operated by either hand or foot.
- With clutch open, will make 44 strokes per minute.
- Made of high grade cast iron, hardened clutch and clutch pin, shear steel blades.
- Blades can easily be replaced by taking out several screws.
- From floor to top of machine—56" with stand. Floor to shear blade 36". Floor space required —24" x 27".
- THIS MACHINE GUARANTEED FOR WORKMANSHIP AND DURABILITY.

- Price of shear with motor and switch ..... $450.00
¾ HP motor required for power.

Shipping weight approx. 560 lbs. with stand.

BATEMAN FOUNDRY & MACHINE CO.
MINERAL WELLS, TEXAS

## appointments *(Continued)*

J. F. Spitzel

Richard L. Herron

▸ J. F. SPITZEL as East Central district sales manager and Richard L. Herron as West Central district sales manager for the Air Conditioning Div., American Radiator & Standard Sanitary Corp. Mr. Spitzel will supervise sales in Boston, Buffalo, Cleveland, Detroit, Ohio, Pittsburgh and the tri-state area. Mr. Herron will have supervision over the territory comprising Chicago, Kansas City, Minnesota, Omaha, St. Louis, Wisconsin and Illinois.

▸ J. A. KLAIBER as district supervisor of the St. Louis district office for the air conditioning and refrigeration division of Worthington Corp. Mr. Klaiber, who has been with the company for 25 years, was previously assistant district manager of the St. Louis office. J. H. Loomis has been appointed manager of Worthington's St. Louis office, succeeding P. A. Mack, who will now devote full time to the handling of special customers and assignments. Mr. Mack was manager of the St. Louis office for 23 years. Loeffler-Greene Supply Co. has been named wholesaler of air conditioning equipment in Oklahoma City and certain other counties in Oklahoma.

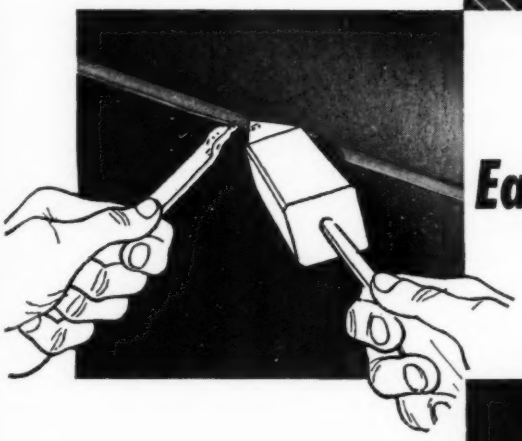
▸ WILLIAM T. BRENT as sales representative covering Arkansas, Louisiana, Mississippi and western Tennessee for Temco, Inc. Before his recent appointment, he was assistant to the sales manager at the company's home office in Nashville.

▸ THE AIRCON AND HEATING Supply Co., Inc., Pittsburgh as wholesale distributor of "Precipitron" electronic air cleaners and "Unitaire" packaged air conditioners for the Westinghouse Electric Corp. The Aircon company will serve the Ohio, West Virginia and Pennsylvania areas surrounding Pittsburgh.

▸ THE NOLAND CO., INC., Spartanburg, S. C. as distributor of air conditioning products in the Spartanburg area for the Union Asbestos & Rubber Co.

▸ ROBERT SCULLY as a sales representative for the Scully Signal Co. of Melrose, Mass.

## Easy to Work...



## Easy to Solder...

# FOLLANSBEE *TERNE*

*. . . still your best bet for profit*

The ductility of Follansbee Terne makes it *so easy* to bend and shape and, because it is already primed, Follansbee Terne will give you a perfect soldered joint every time.

In terms of dollars and sense, this *workability* of Follansbee Terne will cut installation time and cost for you.

Follansbee Terne will not peel or crack, will not stain, and will last a lifetime. You never have to worry about expansion and contraction when you use Terne.

And remember, Follansbee Terne will give you the best job at the best profit every time.

*Write for information about our new pan former and seamer which make standing seam Terne roofs economical.*

**Follansbee Terne is Carried in Stock by Leading Sheet Metal Distributors Everywhere.**

## FOLLANSBEE STEEL CORPORATION

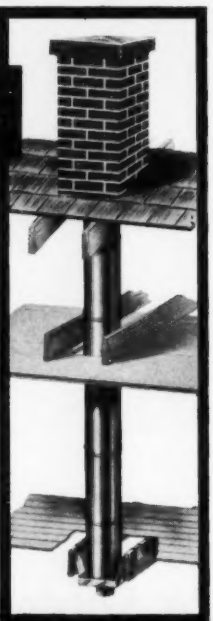
**General Offices, Follansbee, West Virginia**

***Sales Offices in Principal Cities***

*Cold Rolled Strip* *Seamless Terne Roll Roofing* *Polished Blue Sheets and Coils*

**Now!**

**NEW AIR-JET "BRICK BEAUTY"**



Why bother to build a chimney? Now you can enjoy all the time and money-saving advantages of an Air-Jet packaged unit . . . and, at the same time, increase the value of your homes with a chimney that looks just like brick!

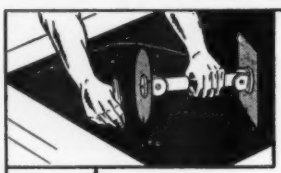
The new "Brick Beauty" is made of embossed aluminum, finished in brick red color with depressed off-white mortar lines. Weighs less than 100 lbs.! Can be installed in one man-hour! And look at these quality features.

Shockproof, high temperature porcelain steel smoke pipe. Special draft top guards against downdrafts. Exclusive rain groove eliminates all leakage. UL approved for use with all fuels. You can take your choice of 2 models in 3 different smoke pipe sizes.

**WRITE TODAY**
for complete information!
A few distributorships available.

**GENERAL PRODUCTS COMPANY, INCORPORATED**
DEPT. B-6
FREDERICKSBURG, VIRGINIA

• A PACKAGED CHIMNEY WITH AUTHENTIC BRICK LOOK



*Order this time saver today*

**JET PATTERN DEVELOPER**

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ONLY $69.50
COMPLETE WITH 30 TEMPLATES

LAYOUT ANY PATTERN COMPLETE IN MINUTES.

ATTACH TEMPLATES, ADJUST FOR PITCH OR OFFSET AND ROLL OUT PATTERN.

**H. OWENS COMPANY**
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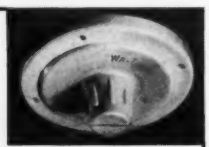

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## appointments *(Continued)*

▶ MID-WAY SUPPLY CO., Zion, Ill. as a wholesaler of heating and cooling products for the Century Engineering Corp.

William A. Schweitzer

R. Wayne Miller

▶ WILLIAM A. SCHWEITZER as sales and service representative in the Pittsburgh territory for the Janitrol Heating & Air Conditioning division of Surface Combustion Corp. His offices will be at 601 Grant Bldg., Pittsburgh. R. Wayne Miller has been named sales representative for the division in north central Ohio. He will have offices at 717 Ash St., Willard, O.

▶ A. A. JOHNSON as furnace sales division representative in Minnesota and North Dakota for Perfection Industries, Inc. He replaces Harry Erikson who has been promoted to furnace sales engineer for the western division. The O'Day Equipment Co., Fargo, N. Dak. has been appointed a distributor of furnaces in North Dakota and parts of Minnesota, Montana and South Dakota.

A. A. Johnson

Vince Reynolds

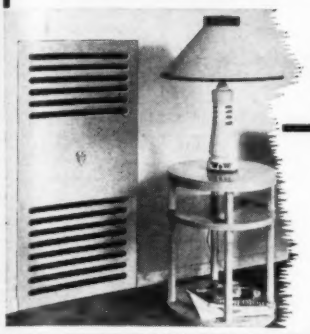
▶ VINCE REYNOLDS as a sales representative in the Dallas office of A-P Controls Corp. Mr. Reynolds will work with Bill Cody on air conditioning and heating sales in the territory comprising Texas, Oklahoma, Louisiana and Arizona.

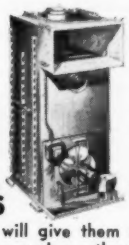
▶ FRANK R. SPRATT, formerly southern California sales manager for the Day & Night division of Carrier Corp., as California regional manager for the division. Lewis G. Elia, formerly of the development engineering department, has been promoted to the

# TROPIC WALL

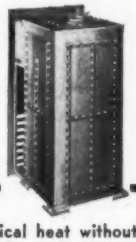
NO. II

## OIL FURNACE





At left is front view with panel removed. Shows automatic fan and limit switch for maximum safety. At right is rear view of "Tropic Wall" Furnace.



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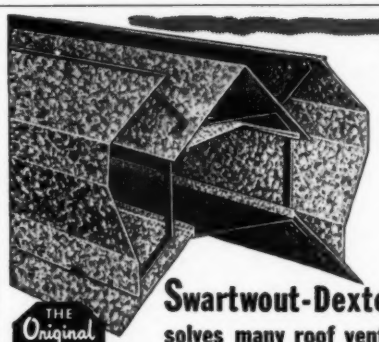

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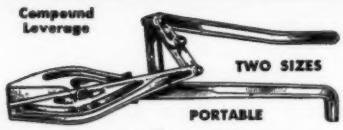


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**AMERICAN ARTISAN**

**6 N. Michigan Ave., CHICAGO 2, ILL.**

## appointments *(Continued)*

sales engineering staff. Donald R. Starin has also been appointed to the staff of the sales engineering department. Formerly he was with the Alhambra Sheet Metal Co. as sales engineer.

▸ The Brown Boggs Foundry & Machine Co., Ltd., 275 Sherman Ave., N., Hamilton, Ontario as Canadian distributor of "Mipatan" electric hammers for Gibson Industries, Inc.

▸ B. H. Nunnally, Skyline Drive, R. D. #4, Syracuse as manufacturers' representative for The Mammoth Furnace Co. to cover part of New York state. Other newly appointed manufacturers' representatives are Irvington Co., 1413 Hertel Ave., Buffalo, who will cover the western part of New York state and northwestern Pennsylvania; Paul Thompson and Co., 231 N. Third St., Philadelphia, who will handle sales in Maryland and Delaware and parts of the states of Pennsylvania and New Jersey; Bel-Air Co., 30 Howells Rd., Belmont, Mass., whose territory will include the states of Maine, New Hampshire, Vermont, Rhode Island and part of Massachusetts; Fred M. Dygert Co., 900 Monroe, N. W., Grand Rapids, Mich. who will cover the state of Michigan; Bernard M. Packtor Co., 95 Hemlock Rd., New Haven, Conn., who will act as representative in the state of Connecticut and part of Massachusetts; and John L. Stewart Co., 524 Fairbanks Ave., Oakland, Calif., who will cover parts of California and Nevada.

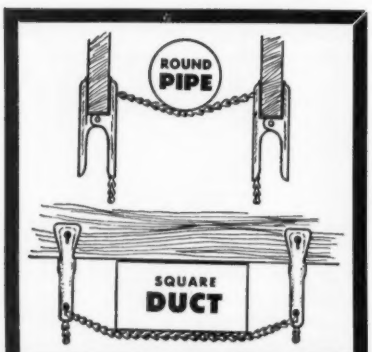
▸ Ray V. Norman as a sales representative of The Peerless Electric Co.'s fan and blower division. Mr. Norman will call on distributors, contractors and architects in the New England states. His office is located at 1116 Great Plains Ave., Needham 92, Mass.

▸ Leon Bennett Associates, Marietta, Ga., as sales representatives in the states of Georgia, Florida, Alabama and Tennessee for Shana Mfg., Inc.

## Obituary

### George W. Best

George W. Best, assistant secretary-treasurer and credit manager for Demmler Bros. Co., Pittsburgh, died Tuesday, May 3. Mr. Best, who was 68 years old, had been associated with the Demmler company for 19 years. Surviving are his wife, a son and daughter, and three grandchildren.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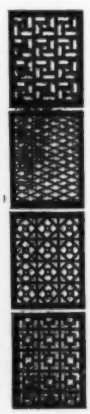

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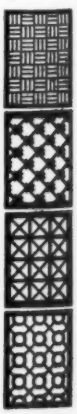

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### *miscellaneous . . .*

INVENTORS AND MANUFACTURERS: Patentability Searches. Practice before the United States Patent Office. Invention Record and Patent Information Booklet free on request. Franklin W. Durgin, Registered Patent Agent, 410 Hill Building, Washington 6, D. C.


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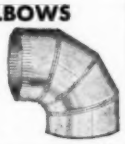

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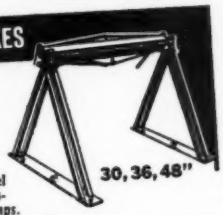

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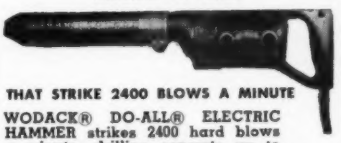

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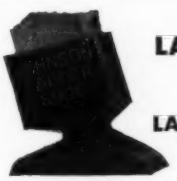

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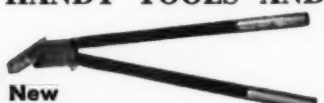

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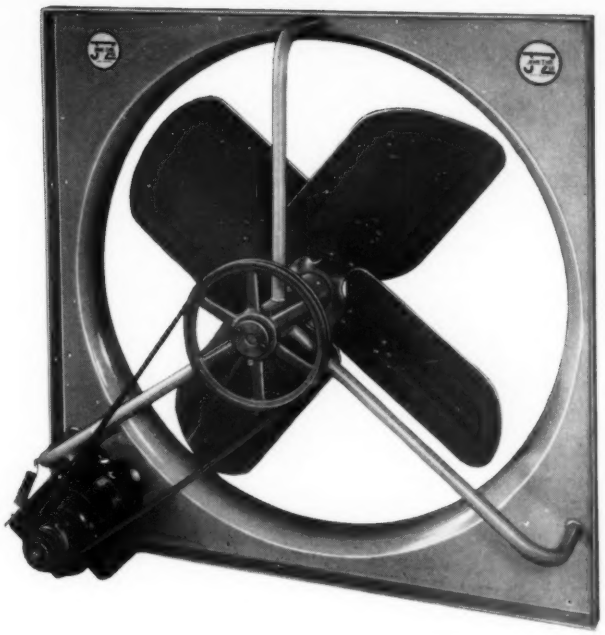

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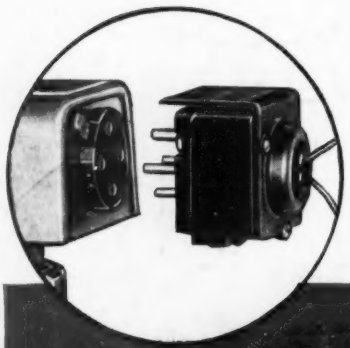

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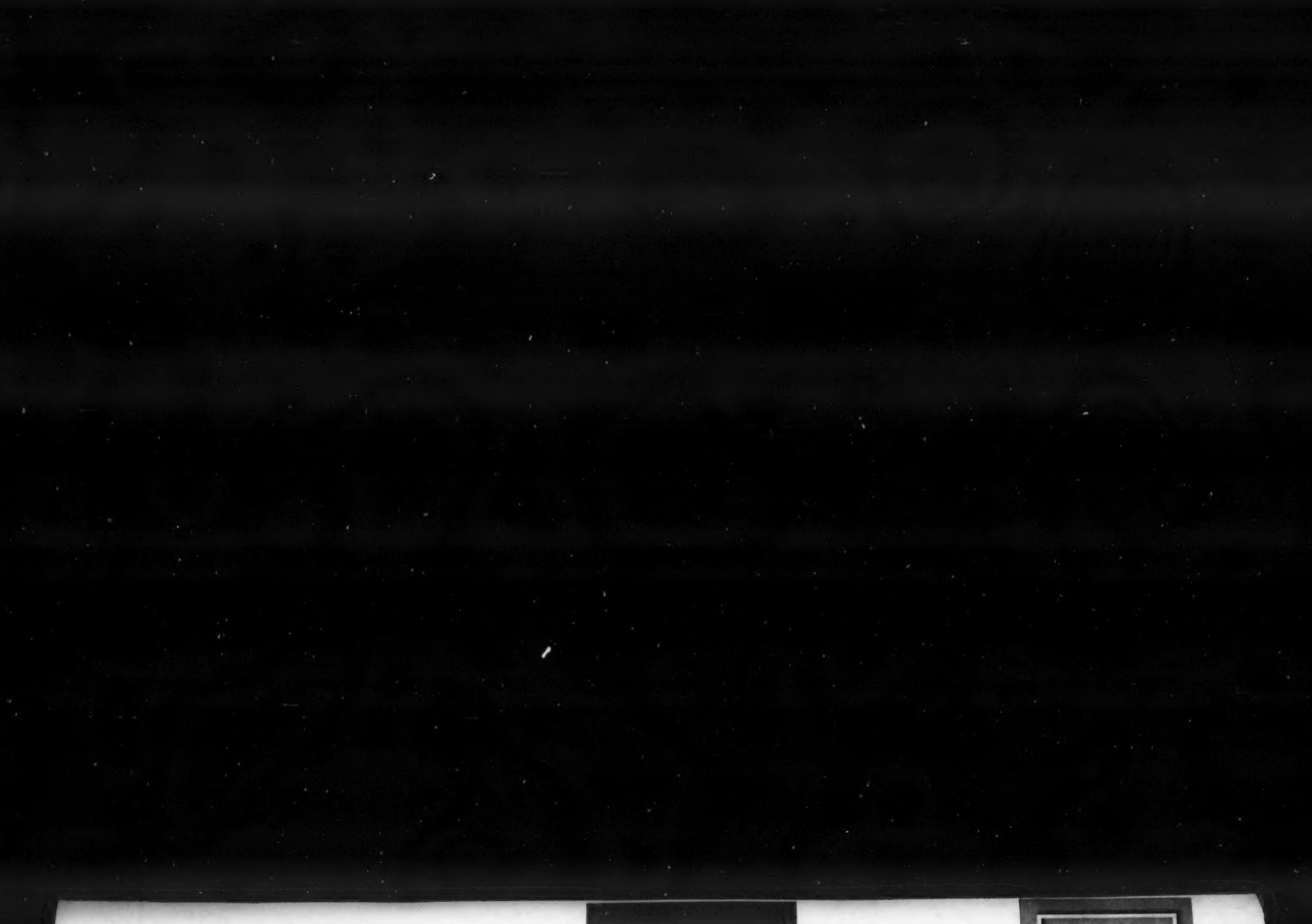
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